01. 0580_m24_ms_22 Q: 3

	$3m+10k$ final answer	**2**	**B1** for $3m$ or $10k$ in final answer or for $3m+10k$ seen and spoilt

02. 0580_m24_ms_22 Q: 8

(a)	$-2 \quad 1 \quad 6$	**2**	**B1** for any 2 correct in correct position If 0 scored **SC1** for $-3-2 \quad 1$
(b)	3^{n-1}	**2**	**B1** for 3^{an+k} , $a \neq 0$ or 3^c for any integer c>1

03. 0580_m24_ms_22 Q: 18

	$14x^3$	**2**	**B1** for $14x^k$ or $7x^3$ or $2x^3$

04. 0580_m24_ms_22 Q: 21

(a)	$\frac{1}{5}$ oe	**1**	
(b)	$64x^9$	**2**	**B1** for $64x^k$ or kx^9 as final answer or correct answer spoiled

05. 0580_m24_ms_22 Q: 22

	$[y =]\frac{24}{(x+3)^2}$ oe final answer	**2**	**M1** for $y = \frac{k}{(x+3)^2}$

06. 0580_m24_ms_22 Q: 24

Question	Answer	Marks	Partial Marks
	$[a =]$ 64 $[b =]$ −8	**2**	**B1** for each or for both $(x - 8)^2$ and $x^2 - 16x + 64$

07. 0580_s24_ms_21 Q: 3

(a)	40 –275	**2**	**B1** for each
(b)	24	**2**	**B1** for 324 or 289 or $\sqrt{300}$ or 17.3…

08. 0580_s24_ms_21 Q: 8

	$7n + 4$ oe final answer	**2**	**B1** for $7n + j$ or $kn + 4$ $k \neq 0$, or $7n + 4$ seen then spoilt

09. 0580_s24_ms_21 Q: 11

	$y < x$ $x < 6$ $1 \leqslant y \leqslant 5$ oe	**4**	**B1** for $y < x$ **B1** for $x < 6$ **B2** for $1 \leqslant y \leqslant 5$ or **B1** for $y \geqslant 1$ or $y \leqslant 5$ If B0 scored, **SC2** for $y \leqslant x$, $x \leqslant 6$ and $1 < y < 5$ oe or **SC1** for three correct from $y = x$, $x = 6$, $y = 1$ and $y = 5$

10. 0580_s24_ms_21 Q: 12

	Correctly equating one set of coefficients	**M1**	
	Correct method to eliminate one variable	**M1**	
	$x = 10$, $y = -2$	**A2**	**A1** for $x = 10$ **A1** for $y = -2$ If M0 scored **SC1** for 2 values satisfying one of the original equations.

11. 0580_s24_ms_21 Q: 18

	$y = 2x$ ruled	**B1**	
	$x = -0.5$ to -0.55 $x = 0.85$ to 0.9	**B2**	**B1** for -0.5 to -0.55 **B1** for 0.85 to 0.9

12. 0580_s24_ms_21 Q: 19

(a)	$3(2m + 5t)(2m - 5t)$ final answer	**3**	**B2** for $(6m + 15t)(2m - 5t)$ or $(2m + 5t)(6m - 15t)$ or **B1** for $3(4m^2 - 25t^2)$ or $(2m + 5t)(2m - 5t)$
(b)	$(x + 3)(y + 5)$ final answer	**2**	**B1** for $x(y + 5) + 3(y + 5)$ or $y(x + 3) + 5(x + 3)$

13. 0580_s24_ms_22 Q: 19

(a)	12	**3**	**M1** for $y = k(x-1)^2$ oe **M1** for $y =$ *their* $k(7-1)^2$ oe
(b)	divided by 3 oe	**1**	

14. 0580_s24_ms_22 Q: 21

	$4x^2 + 3x - 85[=0]$ or $16y^2 - 113y + 7[=0]$ oe simplified	**M2**	**M1** for $4(x^2 - 18) + 3x = 13$ or $x^2 - 18 = \frac{13-3x}{4}$ or $y = \left(\frac{13-4y}{3}\right)^2 - 18$ oe or better
	correct method to solve *their* quadratic equation e.g. factors, quadratic formula, completing the square	**M1**	$\frac{-3 \pm \sqrt{3^2 - 4\times4\times-85}}{2\times4}$ oe, $(4x - 17)(x + 5)$ $\frac{-(-113) \pm \sqrt{(-113)^2 - 4\times16\times7}}{2\times16}$ oe, $(16y - 1)(y - 7)$
	$x = -5$ $y = 7$ $x = \frac{17}{4}$ oe $y = \frac{1}{16}$ oe	**B2**	**B1** for one correct pair or two correct x values or two correct y values If B0 scored and at least 2 method marks scored, **SC1** for correct substitution of both of their x values or their y values into $4y + 3x = 13$ or $y = x^2 - 18$

15. 0580_s24_ms_23 Q: 3

	$6x - 9y$ or $3(2x - 3y)$ final answer	**2**	**B1** for $6x$ or $-9y$ in final answer or $6x - 9y$ seen then spoilt

16. 0580_s24_ms_23 Q: 6

	$xy(4x - 5y)$ final answer	**2**	**B1** for $y(4x^2 - 5xy)$ or $x(4xy - 5y^2)$ or $xy(4x - 5y)$ seen then spoilt

17. 0580_s24_ms_23 Q: 11

	[t =] 3 [w =] –2	**2**	**B1** for each

18. 0580_s24_ms_23 Q: 12

(a)	$2g^8$ final answer	**2**	**B1** for final answer kg^8 or $2g^k$ or correct answer seen then spoilt
(b)	$125k^6$ final answer	**2**	**B1** for final answer ck^6 or $125k^c$ or correct answer seen then spoilt

19. 0580_s24_ms_23 Q: 16

	$\frac{A-\pi r^2}{\pi d}$ oe final answer	**2**	**M1** for $A-\pi r^2=\pi dh$ or $\frac{A}{\pi d}=\frac{\pi r^2}{\pi d}+h$ or $\frac{A}{\pi}-r^2=dh$

20. 0580_s24_ms_23 Q: 20

(a)	5	**2**	**M1** for $3^x + 2 = 245$
(b)	2189	**2**	**M1** for x = f(7) or $3^7 + 2$

21. 0580_s24_ms_23 Q: 23

	$\frac{-y-3}{y(y+1)}$ or $\frac{-y-3}{y^2+y}$ or $-\frac{y+3}{y(y+1)}$ or $-\frac{y+3}{y^2+y}$ final answer	**3**	**B1** for $2y-3(y+1)$ oe **B1** for common denominator $y(y + 1)$ or y^2+y isw

22. 0580_s24_ms_23 Q: 25

	$\frac{1-p}{1+t}$ oe final answer	**4**	**B2** for $(p-1)(t-1)$ oe or **B1** for $p(t-1)-(t-1)$ or $t(p-1)-(p-1)$ **B1** for $(1-t)(1+t)$ oe

23. 0580_m23_ms_22 Q: 4

4(a)	–1	**1**	
4(b)	$29 - 6n$ oe final answer	**2**	**B1** for $k - 6n$ or $29 - kn$ or $29 - 6n$ seen then spoiled

24. 0580_m23_ms_22 Q: 5

5	$2g(4 - g)$ final answer	**2**	**B1** for $2(4g - g^2)$ or for $g(8 - 2g)$ or for $2g(4 - g)$ seen then spoiled

25. 0580_m23_ms_22 Q: 7

7(a)	$-\frac{1}{4}$ oe	**2**	**M1** for $15t + t = 4 - 8$ oe
7(b)	9.5 oe	**2**	**M1** for $25 - 2u = 3 \times 2$ oe or for $\frac{25}{3} - 2 = \frac{2u}{3}$

26. 0580_m23_ms_22 Q: 9

9	Correctly eliminating one variable	**M1**	
	$[x =]$ 5	**A1**	
	$[y =] -2$	**A1**	If **M0** scored **SC1** for 2 values satisfying one of the original equations.

27. 0580_m23_ms_22 Q: 13

13	90	**2**	**M1** for a correct area calculation e.g. 8×10 or $0.5 \times 2 \times 10$ or better

28. 0580_m23_ms_22 Q: 15

15	$5w^{625}$ final answer	**2**	**B1** for kw^{625} or $5w^{k}$ final answer or for $5w^{625}$ then spoiled

29. 0580_m23_ms_22 Q: 16

Question	Answer	Marks	Partial Marks
16	4.5 oe	**3**	**M2** for $2^2 \times y = 3^2 \times 2$ OR **M1** for $y = \frac{k}{x^2}$ **M1** for $y = \frac{theirk}{2^2}$

30. 0580_m23_ms_22 Q: 19

19	0 and –3	**3**	**B2** for $x^2 + 3x$ [= 0] or better or **M1** for $10 - 6x = x^2 - 3x + 10$ oe or for correct simplification of *their* quadratic to the form $ax^2 + bx + c$ [= 0] or better or finding $y = 28$ and $y = 10$

31. 0580_m23_ms_22 Q: 20

20(a)	$(n-1)^3 - 1$ oe	**2**	**M1** for any cubic or third differences = 6
20(b)	$24 \times \left(\frac{1}{2}\right)^{n-1}$ oe	**2**	**M1** for $c \times \left(\frac{1}{2}\right)^{an+b}$ oe where a, b and c are constants and $a > 0$

32. 0580_m23_ms_22 Q: 23

23	$\frac{5x-4}{x+3}$ final answer	**4**	**B2** for $(5x-4)(x-3)$ or **B1** for $(5x+a)(x+b)$ with $ab = 12$ or $a + 5b = -19$ or for $5x(x-3)-4(x-3)$ or $x(5x-4)-3(5x-4)$ **B1** for $(x+3)(x-3)$

33. 0580_m23_ms_22 Q: 25

25	$\sqrt[3]{x-1}$ or $(x-1)^{\frac{1}{3}}$	**2**	**M1** for $x = y^3 + 1$ or for $y - 1 = x^3$ or better

34. 0580_s23_ms_21 Q: 8

Question	Answer	Marks	Partial Marks
(a)	9 6 1	**2**	**B1** for 2 correct
(b)	$3n + 4$ oe final answer	**2**	**B1** for $3n + j$ or $kn + 4$ $k \neq 0$, or $3n + 4$ seen then spoilt

35. 0580_s23_ms_21 Q: 14

Question	Answer	Marks	Partial Marks
	3.2 oe	**3**	**M1** for $y = k(x+3)^2$ oe or better **M1** for substituting *their* k into $y = k(1+3)^2$

36. 0580_s23_ms_21 Q: 17

Question	Answer	Marks	Partial Marks
	$27x^9$ final answer	**2**	**B1** for answer $27x^n$ or nx^9, or for correct answer seen and spoilt

37. 0580_s23_ms_21 Q: 20

Question	Answer	Marks	Partial Marks
(a)	0.75 and –1.25	**1**	
(b)	Correct curve	**3**	**B2 FT** for 6 or 5 correct plots or **B1 FT** for 4 or 3 correct plots
(c)	ruled line $y = 2x + 1$	**B2**	**B1** for correct equation $[y =]2x + 1$ soi or $y = 2x + k$ or $y = kx + 1$ drawn
	−0.35 to −0.45	**B1**	

38. 0580_s23_ms_21 Q: 21

Question	Answer	Marks	Partial Marks
(a)	− 9	**3**	**B2** for $3x^2 - 12$ isw or **B1** for $3x^2 - k$ or $kx^2 - 12$
(b)	(− 2, 16) (2, − 16)	**3**	**M1** for *their* $(3x^2 - 12) = 0$ or stating $\frac{dy}{dx} = 0$ **A1** for $x = \pm 2$ or (− 2, 16) or (2, − 16)

39. 0580_s23_ms_22 Q: 8

Question	Answer	Marks	Partial Marks
(a)	5	**1**	

Question	Answer	Marks	Partial Marks
(b)	$x \geqslant 3$ final answer	**3**	**M1** for correct first step $11x - 3 \geq 4x + 18$ or $5.5x - 1.5 \geqslant 2x + 9$ or better **M1** for correctly collecting *their* x terms on one side and *their* number terms on the other side e.g. $11x - 4x \geqslant 18 + 3$ or better

40. 0580_s23_ms_22 Q: 12

Question	Answer	Marks	Partial Marks
(a)	53	**2**	**M1** for $a \times 8^2 + b = 181$ oe seen
(b)	–8	**1**	

41. 0580_s23_ms_22 Q: 14

Question	Answer	Marks	Partial Marks
	$\frac{x-2}{5}$ oe final answer	**2**	**M1** for a correct first step $x = 5y + 2$ or $y - 2 = 5x$ or $\frac{y}{5} = x + \frac{2}{5}$

42. 0580_s23_ms_22 Q: 18

Question	Answer	Marks	Partial Marks
	$\frac{5c}{2c-3}$ oe final answer	**4**	**M1** for correctly clearing the denominator **and** expanding bracket or correctly clearing the denominator **and** dividing by c **M1** for correctly collecting terms in x on one side and terms not in x on the other **M1** for correct factorising **M1** for correct division dependent on x appearing only once in a factorised expression Maximum 3 marks for an incorrect answer

43. 0580_s23_ms_22 Q: 19

Question	Answer	Marks	Partial Marks
	0.16 oe	**3**	**M1** for $m = \frac{k}{(t+2)^2}$ oe **M1** for substituting *their k* into $m = \frac{their\ k}{(8+2)^2}$ OR **M2** for $0.64 \times (3+2)^2 = m(8+2)^2$ oe

44. 0580_s23_ms_22 Q: 22

Question	Answer	Marks	Partial Marks
	$\frac{22x+3}{(3x+2)(2x-1)}$ final answer	**3**	**B1** for a common denominator $(3x + 2)(2x – 1)$ oe isw **B1** for $5(2x – 1) + 4(3x + 2)$ oe isw

45. 0580_s23_ms_23 Q: 4

Question	Answer	Marks	Partial Marks
	72.6	**2**	**M1** for $4 - 9.8 \times -7$ or better

46. 0580_s23_ms_23 Q: 5

Question	Answer	Marks	Partial Marks
	d^6	**1**	

47. 0580_s23_ms_23 Q: 6

Question	Answer	Marks	Partial Marks
	52	**2**	**M1** for $12 = x \times \frac{3}{13}$ oe or better e.g. $12 \div \frac{3}{13}$ oe

48. 0580_s23_ms_23 Q: 9

Question	Answer	Marks	Partial Marks
(a)	32.5	**2**	**M1** for $\frac{65}{\textit{their time}}$ or $\frac{\textit{their distance}}{2}$
(b)	correct ruled line from (12 00, 65) to (13 18, 0)	**1**	

49. 0580_s23_ms_23 Q: 17

Question	Answer	Marks	Partial Marks
	$m=\frac{2k}{(2-R)}$ or $m=\frac{-2k}{(R-2)}$ final answer	**4**	**M1** for clearing fractions **M1** for expanding brackets (or ÷ 2) **M1** for collecting terms in m on one side and terms not in m on the other **M1** for dividing by a bracket maximum of **3** if final answer incorrect

50. 0580_s23_ms_23 Q: 18

Question	Answer	Marks	Partial Marks
	8	**3**	**M1** for $y=\frac{k}{\sqrt[3]{x+5}}$ oe **M1** for substituting *their k* into $y=\frac{k}{\sqrt[3]{22+5}}$ oe OR **M2** for $12\sqrt[3]{3+5}=y\sqrt[3]{22+5}$ oe

51. 0580_s23_ms_23 Q: 19

Question	Answer	Marks	Partial Marks
	$\frac{-5 \pm \sqrt{5^2 - 4\times1\times-7}}{2\times1}$	B2	**B1** for $\sqrt{5^2 - 4\times1\times-7}$ and if in form $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ **B1** for $p = -5$ and $r = 2\times1$
	−6.14 and 1.14 cao	B2	**B1** for 1 correct answer for −6.1 and 1.1 or −6.140... and 1.140... or 6.14 and −1.14 or correct answers seen in working

52. 0580_s23_ms_23 Q: 20

Question	Answer	Marks	Partial Marks
(a)	$6x + 5$ cao final answer	2	**M1** for $6(x+2) - 7$ oe
(b)	$\frac{x+7}{6}$ or $\frac{x}{6} + \frac{7}{6}$ final answer	2	**M1** for $x = 6y - 7$ or $y + 7 = 6x$ or $\frac{y}{6} = x - \frac{7}{6}$
(c)	$\frac{1}{5}$ or 0.2	2	**M1** for $x^{-3} = 6\times22 - 7$ or better

53. 0580_s23_ms_23 Q: 21

Question	Answer	Marks	Partial Marks
	$\frac{x+4}{2x+3}$ final answer	4	**B1** for $(2x-3)(2x+3)$ **B2** for $(2x-3)(x+4)$ or **B1** for $(2x + a)(x + b)$ where $ab = -12$ or $a + 2b = 5$ or $x(2x-3) + 4(2x-3)$ or $2x(x+4) - 3(x+4)$

54. 0580_s23_ms_23 Q: 22

Question	Answer	Marks	Partial Marks
	$[a =] \frac{-1}{2}$ oe $[b =] 3$	**5**	**B4** for $\frac{1}{4}n^3 - \frac{1}{2}n^2 + 3n$ seen OR **M2** for any two of $\frac{1}{4} + a + b = 2.75$ $8 \times \frac{1}{4} + 4a + 2b = 6$ $27 \times \frac{1}{4} + 9a + 3b = 11.25$ $64 \times \frac{1}{4} + 16a + 4b = 20$ or **M1** for one correct equation **M1** for correct method to eliminate 1 variable **B1** for 1 correct answer

55. 0580_w23_ms_21 Q: 3

Question	Answer	Marks	Partial Marks
(a)	5	**1**	
(b)	90	**1**	

56. 0580_w23_ms_21 Q: 5

Question	Answer	Marks	Partial Marks
(a)	$7m(6k - 5)$ final answer	**2**	**B1** for $7(6mk - 5m)$ or $m(42k - 35)$ as final answer or $7m(6k - 5)$ seen and then spoiled
(b)	$(h + 12)(h - 12)$ final answer	**1**	

57. 0580_w23_ms_21 Q: 10

Question	Answer	Marks	Partial Marks
(a)	n^6 final answer	**1**	
(b)	$4x^4$ final answer	**2**	**B1** for kx^4 or $4x^k$ as final answer or correct answer seen and then spoiled
(c)	$9y^8$ final answer	**2**	**B1** for ky^8 or $9y^k$ final answer or correct answer seen and spoiled

58. 0580_w23_ms_21 Q: 11

Question	Answer	Marks	Partial Marks
	$x \geqslant 11$ final answer	**3**	**M1** for $8x - 12 \geqslant 43 + 3x$ or better **M1** for e.g. $8x - 3x \geqslant 43 + 12$ oe OR **M1** for $2x - 3 \geqslant \frac{43}{4} + \frac{3x}{4}$ **M1** for $2x - \frac{3x}{4} \geqslant \frac{43}{4} + 3$

59. 0580_w23_ms_21 Q: 16

Question	Answer	Marks	Partial Marks
	[Lower bound =] 39.9 nfww [Upper bound =] 42.1 nfww	**3**	**B2** for one correct or **M1** for 11 + 0.5 or 9.5 + 0.05 or 11 – 0.5 or 9.5 – 0.05

60. 0580_w23_ms_21 Q: 20

Question	Answer	Marks	Partial Marks
(a)	$\frac{10x}{x+5}$ final answer	**3**	**B1** for $10x(x - 6)$ **B1** for $(x - 6)(x + 5)$

Question	Answer	Marks	Partial Marks
(b)	$\frac{61x+8}{(x+3)(8x-1)}$ final answer	3	**B1** for common denominator of $(x + 3)(8x – 1)$ isw **B1** for $7(8x – 1) + 5(x + 3)$ or better isw

61. 0580_w23_ms_22 Q: 3

Question	Answer	Marks	Partial Marks
	16	2	**B1** for –14 or **M1** for $30 – 2 \times 7$

62. 0580_w23_ms_22 Q: 10

Question	Answer	Marks	Partial Marks
	$5w – t$ final answer	2	**B1** for $2t + 2w$ or $3w – 3t$ or for $5w – t$ seen then spoiled or for $5w$ or $– t$ in the final answer

63. 0580_w23_ms_22 Q: 12

Question	Answer	Marks	Partial Marks
(a)	2.5 oe	1	
(b)	140	2	**M1** for a correct area e.g. 10×12, $\frac{1}{2} \times 4 \times 10$, $0.5 \times (16 + 12) \times 10$

64. 0580_w23_ms_22 Q: 13

Question	Answer	Marks	Partial Marks
(a)	1.2 oe	2	**B1** for 3^{2p+3p} or 3^6 soi
(b)	$2x^2$ final answer	2	**B1** for kx^2 or $2x^k$ as final answer or correct answer spoiled

65. 0580_w23_ms_22 Q: 14

Question	Answer	Marks	Partial Marks
	$[\pm]\sqrt{\frac{y+x}{2}}$ oe final answer	**3**	**M1** for isolating term in w **M1** for division by 2 **M1** for square root Max 2 marks if answer incorrect

66. 0580_w23_ms_22 Q: 16

Question	Answer	Marks	Partial Marks
	$24x^{12}$ final answer	**2**	**B1** for $24x^{k}$ or kx^{12} in final answer

67. 0580_w23_ms_22 Q: 19

Question	Answer	Marks	Partial Marks
(a)	$14 - 3n$ oe final answer	**2**	**B1** for $14 - kn$ or $c - 3n$ or $14 - 3n$ seen then spoiled
(b)	5^{n-1} oe	**2**	**B1** for 5^{an+b} where $a > 0$ or 5^{k} for any integer $k > 1$

68. 0580_w23_ms_22 Q: 22

Question	Answer	Marks	Partial Marks
	$\frac{12}{\sqrt{w}}$ oe final answer	**2**	**M1** for $x = \frac{k}{\sqrt{w}}$ oe

69. 0580_w23_ms_22 Q: 24

Question	Answer	Marks	Partial Marks
	$\frac{x-2}{a+1}$ final answer	4	**B2** for $(x-2)(a-1)$ or **M1** for $a(x-2)-(x-2)$ or $x(a-1)-2(a-1)$ **B1** for $(a-1)(a+1)$

70. 0580_w23_ms_22 Q: 25

Question	Answer	Marks	Partial Marks
	$a=3$ $k=5$	2	**B1** for each or **M1** for $2\times7ax^6+3kx^{k-1}$ or better

71. 0580_w23_ms_23 Q: 9

Question	Answer	Marks	Partial Marks
	$4.5, 4\frac{1}{2}$ or $\frac{9}{2}$	3	**M2** for $y^2=\frac{3P}{2w}$ or $y^2=\frac{3\times108}{2\times8}$ or better or **M1** for $108=\frac{2\times8\times y^2}{3}$ or better

72. 0580_w23_ms_23 Q: 15

Question	Answer	Marks	Partial Marks
	$[d=]\ \frac{T^2+e}{3}$ oe final answer	3	**M1** for $T^2=3d-e$ **M1** for isolating term in d **M1** for dividing by 3 Max 2 marks if answer incorrect

73. 0580_w23_ms_23 Q: 17

Question	Answer	Marks	Partial Marks
(a)	$16y^{18}$ final answer	2	**B1** for $16y^k$ or ky^{18} as final answer or correct answer spoiled
(b)	$\frac{1}{x+5}$ final answer	2	**B1** for $(x + 5)(x – 5)$

74. 0580_w23_ms_23 Q: 18

Question	Answer	Marks	Partial Marks
	19	3	**M2** for $\left(1+\frac{40}{100}\right)\left(1-\frac{15}{100}\right)$ [ma] oe or **M1** for $F = kma$ or better or $\left(1+\frac{40}{100}\right)$ **and** $\left(1-\frac{15}{100}\right)$ oe seen

75. 0580_w23_ms_23 Q: 20

Question	Answer	Marks	Partial Marks
	[a =] – 3 [b =] 1 [c =] – 15	3	**B1** for $a = – 3$ **B1FT** for $b = 7 + 2 \times$ *their a* **B1FT** for $c = 6 + 7 \times$ *their a* If B0 scored **B1** for correct expansion of a pair of brackets or of three brackets $\left(x^2+ax+2x+2a\right)\left[2x+3\right]$ or $\left[x+a\right]\left(2x^2+4x+3x+6\right)$ or $2x^3+\left(2a+7\right)x^2+\left(7a+6\right)x+6a$ oe or for $b=7+2a$ or for $c=6+7a$

76. 0580_m22_ms_22 Q: 7

Question	Answer	Marks	Partial Marks
	$n > – 1$ oe	1	

77. 0580_m22_ms_22 Q: 9

Question	Answer	Marks	Partial Marks
	$3a\left(4a^2-7\right)$ final answer	**2**	**B1** for $3\left(4a^3-7a\right)$ or $a\left(12a^2-21\right)$ or for $3a\left(4a^2-7\right)$ seen then spoilt

78. 0580_m22_ms_22 Q: 10

Question	Answer	Marks	Partial Marks
(a)	8 11 16	**2**	**B1** for two correct
(b)	$23 - 8n$ oe final answer	**2**	**B1** for $j - 8n$ or $23 - kn$ $k \neq 0$ or $23 - 8n$ seen then spoilt

79. 0580_m22_ms_22 Q: 13

Question	Answer	Marks	Partial Marks
(a)	h^7 final answer	**1**	
(b)	$\frac{x^3}{343}$ final answer	**1**	
(c)	6	**1**	

80. 0580_m22_ms_22 Q: 18

Question	Answer	Marks	Partial Marks
	A correct equation leading to 41	**3**	**M2** for $4x = 164$ or **M1** for $x + 2(x - 24) + x - 16 = 100$ oe or **M1** for correctly simplifying *their* equation to the form $kx = c$ provided at least one part correct from $[2](x - 24)$ oe or $x - 16$ or **B1** for answer 41 without an equation in x shown

81. 0580_m22_ms_22 Q: 19

Question	Answer	Marks	Partial Marks
	$\frac{2}{3}$ oe	**3**	**M1** for $y=\frac{k}{\sqrt{x+4}}$ **M1** for $y=\frac{theirk}{\sqrt{77+4}}$

82. 0580_m22_ms_22 Q: 20

Question	Answer	Marks	Partial Marks
	$x^2+6x-40$ [=0] or $y^2-40y-41$ [=0]	**M2**	**M1** for correct method to eliminate one variable e.g. $x^2-2(11-3x)=18$ or $\frac{(11-y)^2}{3^2}-2y=18$
	$(x-4)(x+10)$ [=0] or $(y-41)(y+1)$ [=0]	**M1**	or for correct factors for *their* quadratic equation or for correct use of quadratic formula for *their* quadratic equation or for correctly completing the square for *their* quadratic equation
	$x=4, y=-1$ $x=-10, y=41$	**B2**	**B1** for $x=4, x=-10$ or for $y=-1, y=41$ or for a correct pair of x and y values If B0 scored and at least 1 method mark scored **SC1** for correct substitution shown of both of *their* x values or *their* y values into $3x+y=11$ or $x^2-2y=18$

83. 0580_s22_ms_21 Q: 8

Question	Answer	Marks	Partial Marks
(a)	7.2 oe	**1**	
(b)	[±] $\sqrt{\frac{2s}{a}}$ final answer	**2**	**M1** for $\frac{s}{a}=\frac{1}{2}t^2$ or $2s = at^2$ or better

84. 0580_s22_ms_21 Q: 9

Question	Answer	Marks	Partial Marks
	$7y(2x-y)$ final answer	**2**	**B1** for $7(2xy-y^2)$ or $y(14x-7y)$ or $7y(2x-y)$ seen then spoilt

85. 0580_s22_ms_21 Q: 10

Question	Answer	Marks	Partial Marks
(a)	–3	**1**	
(b)	$27 - 5n$ oe final answer	**2**	**B1** for $j - 5n$ or $27 - kn$, $k \neq 0$ or for $27 - 5n$ seen then spoilt

86. 0580_s22_ms_21 Q: 15

Question	Answer	Marks	Partial Marks
	–3	**1**	

87. 0580_s22_ms_21 Q: 20

Question	Answer	Marks	Partial Marks
(a)	1.5 or $1\frac{1}{2}$	**1**	
(b)	240	**2**	**M1** for one correct area

88. 0580_s22_ms_21 Q: 21

Question	Answer	Marks	Partial Marks
	$(1-q)(1-a)$ or $(a-1)(q-1)$ final answer	**2**	**B1** for $1-q-a(1-q)$ or $1-a-q(1-a)$ or better or correct answer seen and spoilt

89. 0580_s22_ms_21 Q: 22

Question	Answer	Marks	Partial Marks
	$36y^{144}$ final answer	**2**	**B1** for ky^{144} or $36y^{k}$ final answer $k \neq 0$ or correct answer seen and spoilt

90. 0580_s22_ms_21 Q: 23

Question	Answer	Marks	Partial Marks
(a)	$[p=]\ 4$ $[q=]\ -6$	**2**	**B1** for one correct or $(x+4)^2-6$ or $x^2+px+px+p^2$ $[+q]$
(b)	–10 and 2	**2**	**M1** for $(x+4)^2=36$ or $(x+their4)^2=30-their(-6)$ or for correct method to solve quadratic e.g. $(x+10)(x-2)$

91. 0580_s22_ms_21 Q: 25

Question	Answer	Marks	Partial Marks
	$\frac{16}{\sqrt{x}}$ oe final answer	**3**	**M2** for $w=\frac{k}{\sqrt{x}}$ oe OR **M1** for $w=j\sqrt{y}$ **M1** for $y=\frac{c}{x}$

92. 0580_s22_ms_21 Q: 27

Question	Answer	Marks	Partial Marks
	(–2, –1) and (6, 7)	**4**	**B3** for $x = -2$ and 6 OR **M1** for $x^2 - 3x - 11 = x + 1$ or better **M1** for correct method to solve *their* quadratic e.g. $(x+2)(x-6)$ If 0 scored, **SC1** for one correct pair of coordinates

93. 0580_s22_ms_22 Q: 8

Question	Answer	Marks	Partial Marks
	13 16 21	**2**	**B1** for 2 correct terms in correct position or **SC1** for 12, 13, 16

94. 0580_s22_ms_22 Q: 11

Question	Answer	Marks	Partial Marks
	24	**1**	

95. 0580_s22_ms_22 Q: 12

Question	Answer	Marks	Partial Marks
(a)	correct graph	**3**	**B1** for line from (0, 0) to (1.5, 30) **B1** for horizontal line from (*their* 1.5, *their* 30) for 0.5 hours **B1** for a line from (*their* 2, *their* 30) ending at distance 70 with a gradient of 16 Provided it fits on the grid and *their* 30 is <70

Question	Answer	Marks	Partial Marks
(b)	15.6 or 15.55 to 15.56 nfww	3	**M2** for 70 ÷ (*their* final time in hours) (final time =) $1.5 + 0.5 + \frac{70 - \textit{their}30}{16}$ or 4.5 or *their* final time from graph or **M1** for 70 ÷ any time

96. 0580_s22_ms_22 Q: 18

Question	Answer	Marks	Partial Marks
(a)	2.5	3	**M1** for $y = k \times \sqrt[3]{x+1}$ **M1** for $y = \textit{their}k \times \sqrt[3]{124+1}$
(b)	multiplied by 4 oe	1	

97. 0580_s22_ms_22 Q: 19

Question	Answer	Marks	Partial Marks
(a)	$\frac{x+8}{7}$ final answer	2	**M1** for $x = 7y - 8$ or $y + 8 = 7x$ or $\frac{y}{7} = x - \frac{8}{7}$
(b)	4	2	**M1** for $4 \div \frac{1}{3} + 5$ oe or better

98. 0580_s22_ms_22 Q: 20

Question	Answer	Marks	Partial Marks
(a)	$(2m+3p)(1-4k)$ final answer	2	**B1** for $2m + 3p - 4k(2m+3p)$ or better or $2m(1-4k) + 3p(1-4k)$ or correct answer seen and spoilt
(b)	$5(x-2y)(x+2y)$ final answer	3	**B2** for $(5x - 10y)(x + 2y)$ or $(x - 2y)(5x + 10y)$ or correct answer seen then spoilt or **B1** for $5(x^2 - 4y^2)$ or for $(x-2y)(x+2y)$

99. 0580_s22_ms_22 Q: 21

Question	Answer	Marks	Partial Marks
	[a =] 2 [b =] − 1	**5**	**M2** for correct method to find two simultaneous equations e.g. two from $a\times1^2+b\times1-4=-3$ $a\times2^2+b\times2-4=2$ $3a+b=2--3$ or **M1** for 1 correct equation **M1** for correctly eliminating one variable for *their* simultaneous equations **A1** for a = 2 **A1** for b = − 1

100. 0580_s22_ms_23 Q: 2

Question	Answer	Marks	Partial Marks
	792 or 792.1…	**2**	**M1** for $\frac{4\times7^3}{\sqrt{3}}$ oe or **B1** for 1372

101. 0580_s22_ms_23 Q: 5

Question	Answer	Marks	Partial Marks
	0, 3, 8	**2**	**B1** for 2 correct terms in correct position or **SC1** for −1, 0, 3

102. 0580_s22_ms_23 Q: 6

Question	Answer	Marks	Partial Marks
(a)	y^{-2} or $\frac{1}{y^2}$ final answer	**1**	
(b)	7	**1**	

103. 0580_s22_ms_23 Q: 13

Question	Answer	Marks	Partial Marks
(a)	$9p(2x - 3)$ final answer	**2**	**B1** for $9(2px - 3p)$ or $p(18x - 27)$ or $3p(6x - 9)$ or $9p(2x - 3)$ seen and spoilt
(b)	$(m + n)(t - 1)$ final answer	**2**	**B1** for $m(t - 1) + n(t - 1)$ or $t(m + n) - [1](m + n)$ or correct answer seen and spoilt

104. 0580_s22_ms_23 Q: 14

Question	Answer	Marks	Partial Marks
	$3n^2 + 5$ oe final answer	**2**	**M1** for correctly finding second differences or an answer that is a quadratic sequence

105. 0580_s22_ms_23 Q: 15

Question	Answer	Marks	Partial Marks
	$x \geqslant 2$ final answer	**2**	**M1** for $12x - 4x \geq 13 + 3$ oe

106. 0580_s22_ms_23 Q: 16

Question	Answer	Marks	Partial Marks
	D B C	**B1**	
	$\frac{1}{3}$ or 0.333…	**B1**	
	150	**B2**	or **M1** for $\frac{1}{2} \times 30 \times 10$

107. 0580_s22_ms_23 Q: 19

Question	Answer	Marks	Partial Marks
(a)	3	2	**M1** for $k(-5k)^2 = 675$ or better
(b)	$\frac{5}{7x-2}$ final answer	1	
(c)	$\frac{1}{2}$ or 0.5	4	**B3** for answer $\frac{7}{14}$ OR **B2** for $\frac{5x+2}{7}$ or **M1** for correct first step for $h^{-1}(x)$ e.g. $x = \frac{7y-2}{5}$ $5y = 7x - 2$ $y + \frac{2}{5} = \frac{7x}{5}$ **M1FT** for $\frac{2(5x+2)}{14} + \frac{3-10x}{14}$ oe with common denominator

108. 0580_s22_ms_23 Q: 22

Question	Answer	Marks	Partial Marks
	$\frac{x}{5+x}$ final answer nfww	3	**B1** for $x(5-x)$ **B1** for $(5-x)(5+x)$ or

109. 0580_s22_ms_23 Q: 24

Question	Answer	Marks	Partial Marks
	2.8	3	**M1** for $y = \frac{k}{(x-1)^3}$ **M1** for $y = \frac{their\ k}{(4-1)^3}$ OR **M2** for $y(4-1)^3 = 9.45(3-1)^3$

110. 0580_s22_ms_23 Q: 25

Question	Answer	Marks	Partial Marks
	81	**3**	**M2** for $m^{\frac{3}{4}} = 27$ or better or **M1** for $\frac{1}{m^{\frac{1}{4}}} = \frac{27}{m}$ or better or $m^{-\frac{1}{4}-1} = 27$ If **0** scored **SC1** for answer $\frac{1}{81}$

111. 0580_w22_ms_21 Q: 8

Question	Answer	Marks	Partial Marks
(a)	243	**1**	
(b)	$4n + 9$ oe final answer	**2**	**B1** for $4n + k$ or $jn + 9, j \neq 0$ or for correct answer seen then spoilt

112. 0580_w22_ms_21 Q: 10

Question	Answer	Marks	Partial Marks
	$2x^9$ final answer	**2**	**B1** for kx^9 or $2x^k$ as final answer or $2x^9$ spoiled

113. 0580_w22_ms_21 Q: 11

Question	Answer	Marks	Partial Marks
	[x =] 4 [y =] –1	**2**	**B1** for each

114. 0580_w22_ms_21 Q: 13

Question	Answer	Marks	Partial Marks
(a)	2.8 oe	1	
(b)	175	2	**M1** for a correct relevant area calculation e.g. $(15-5)\times 14$ or $\frac{1}{2}\times 5\times 14$ oe or better

115. 0580_w22_ms_21 Q: 17

Question	Answer	Marks	Partial Marks
	$5x^{625}$ final answer	2	**B1** for final answer kx^{625} or $5x^{k}$ or correct answer spoiled

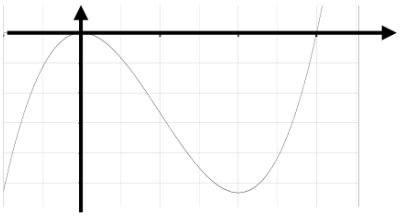
116. 0580_w22_ms_21 Q: 19

Question	Answer	Marks	Partial Marks
	$2x^3-5x^2-4x+12$ final answer	3	**B2** for correct expansion of the three brackets unsimplified or for simplified four-term expression of correct form with three terms correct or **B1** for correct expansion of two of the three given brackets with at least three terms out of four correct

117. 0580_w22_ms_21 Q: 20

Question	Answer	Marks	Partial Marks
(a)	$(1+x)(1-y)$ final answer	2	**B1** for $1+x-y(1+x)$ or $1-y+x(1-y)$
(b)	$2x(x+3y)(x-3y)$ final answer	3	**B2** for $2x(x^2-9y^2)$ or correctly factorising into two brackets e.g. $(2x^2+6xy)(x-3y), (x^2-3xy)(2x+6y)$ or **B1** for $2(x^3-9xy^2)$ or $x(2x^2-18y^2)$ or for $(x+3y)(x-3y)$

118. 0580_w22_ms_21 Q: 21

Question	Answer	Marks	Partial Marks
	Correct sketch with maximum at origin and minimum in fourth quadrant 	2	**B1** for any cubic with exactly 2 distinct turning points

119. 0580_w22_ms_21 Q: 23

Question	Answer	Marks	Partial Marks
	$\frac{144}{w}$ oe	3	**M2** for $y = \frac{k}{w}$ oe or **M1** for $x = cw^2$ or for $y = \frac{j}{\sqrt{x}}$ oe

120. 0580_w22_ms_22 Q: 2

Question	Answer	Marks	Partial Marks
	$-50y$	1	

121. 0580_w22_ms_22 Q: 4

Question	Answer	Marks	Partial Marks
	$3x + x^3$ final answer	2	**B1** for one correct term from two in final answer or for correct answer then spoilt

122. 0580_w22_ms_22 Q: 6

Question	Answer	Marks	Partial Marks
(a)	2 –9	2	**B1** for one correct
(b)	Sequence A $7n - 4$ oe final answer	2	**B1** for $7n + c$ or $kn - 4$ $k \neq 0$ or for correct answer seen then spoilt
	Sequence B $3n^2 - 1$ oe final answer	2	**M1** for finding second differences of 6 or has an answer that is a quadratic sequence or for correct answer seen then spoilt

123. 0580_w22_ms_22 Q: 11

Question	Answer	Marks	Partial Marks
(a)	5	2	**M1** for $(0 - 3)(0 + b)(0 + 2) = -30$ oe or better

Question	Answer	Marks	Partial Marks
(b)	(3, 0)	1	

124. 0580_w22_ms_22 Q: 17

Question	Answer	Marks	Partial Marks
(a)	9	1	
(b)	$2x - 5$ final answer	2	**M1** for correct first step e.g. $x = \frac{y+5}{2}$ or $2y = x + 5$ or $y - \frac{5}{2} = \frac{x}{2}$ or better

Question	Answer	Marks	Partial Marks
(c)	11	3	**M1** for $\frac{x^2 + 5}{2}$ **M1** for $hh^{-1}(63) = 63$ soi

125. 0580_w22_ms_22 Q: 20

Question	Answer	Marks	Partial Marks
(a)	$27x^{12}$ final answer	**2**	**B1** for kx^{12} or $27x^{c}$ final answer or for $27x^{12}$ then spoilt
(b)	[±] y	**1**	

126. 0580_w22_ms_22 Q: 23

Question	Answer	Marks	Partial Marks
	[0 =] $6x^2 - 19x + 3$	**B5**	**B4** for $8x - 20 + 2x + 2 = 6x^2 + 6x - 15x - 15$ or better OR **M2** for $4(2x - 5) + 2(x + 1) = 3(x + 1)(2x - 5)$ oe or **M1** for $4(2x - 5) + 2(x + 1)$ or better or common denominator $(x + 1)(2x - 5)$ or better **B1** for $2x^2 + 2x - 5x - 5$ or better seen **M1** for correctly simplifying *their* quadratic to the form [0 =] $ax^2 + bx + c$
	Correct method to solve *their* three term quadratic	**M1**	e.g. $(6x - 1)(x - 3)$ $\frac{-(-19) \pm \sqrt{(-19)^2 - 4 \times 6 \times 3}}{2 \times 6}$
	$x = 3, x = \frac{1}{6}$ oe	**B1**	

127. 0580_w22_ms_23 Q: 9

Question	Answer	Marks	Partial Marks
	[x =] 9 [y =] 3	**2**	**B1** for each answer

128. 0580_w22_ms_23 Q: 15

Question	Answer	Marks	Partial Marks
(a)	2	**1**	
(b)	25.125	**4**	**M3** for $\frac{15\times30}{2}+30(k-15)[=\text{figs } 45]$ oe OR **B2** for 44 775 or 44.775 OR **M1** for $\frac{15\times30}{2}$ or $30(k-15)$ oe **B1** for 45 000 or 0.225 or 0.03

129. 0580_w22_ms_23 Q: 17

Question	Answer	Marks	Partial Marks
	8	**3**	

130. 0580_w22_ms_23 Q: 19

Question	Answer	Marks	Partial Marks
(a)	$\frac{2}{x-1}$ final answer	**2**	**M1** for $\frac{10}{5x-3-2}$ or better
(b)	$\frac{10}{x}+2$ or $\frac{10+2x}{x}$ final answer	**3**	**M2** for $y-2=\frac{10}{x}$ or $x=\frac{10+2y}{y}$ oe or $yx=10+2x$ oe or **M1** for $x=\frac{10}{y-2}$ or $y(x-2)=10$ oe or better
(c)	$x-1$	**1**	

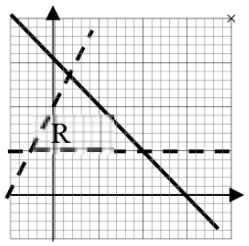
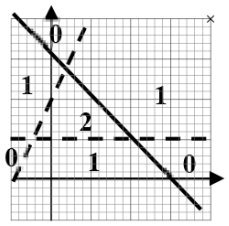
131. 0580_w22_ms_23 Q: 22

Question	Answer	Marks	Partial Marks
(a)	$2x^3 + x^2 - 25x + 12$ final answer	3	**B2** for correct unsimplified expanded expression or for simplified four-term expression of correct form with 3 terms correct or **B1** for correct expansion of 2 brackets with at least 3 terms out of 4 correct
(b)	$\frac{2}{x}$ final answer	4	**M1** for $\left[\frac{4}{2x-3}\right] \times \frac{2x^2+11x-21}{2x^2+14x}$ oe soi **B1** for $(x + 7)(2x - 3)$ oe factorised **B1** for $2x(x + 7)$ oe factorised

132. 0580_m21_ms_22 Q: 14

Question	Answer	Marks	Partial Marks
(a)	1 -6	2	**B1** for each If 0 scored, **SC1** for two terms with a difference of –7
(b)	$n^2 + 3$ oe	2	**M1** for any quadratic or second differences = 2

133. 0580_m21_ms_22 Q: 16

Question	Answer	Marks	Partial Marks
	3 correct ruled lines and R clearly indicated 	5	**B1** for each line $y = 1$ dashed $y = 2x + 2$ dashed $x + y = 3$ solid **B2** for correct region or **B1** for region satisfying 2 inequalities  or **SC1** for shading of the **wanted** region only

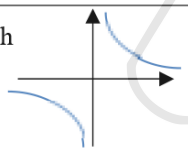
134. 0580_m21_ms_22 Q: 18

Question	Answer	Marks	Partial Marks
	$49x^6$ final answer	2	**B1** for $49x^k$ or nx^6 as final answer

135. 0580_m21_ms_22 Q: 19

Question	Answer	Marks	Partial Marks
	$x^2 + x - 156$ [=0] or $y^2 + 15y - 100$ [=0]	**M2**	**M1** for $x^2 + x = 7 + 149$ or correct substitution
	$(x-12)(x+13)$ [=0] or $(y-5)(y+20)$ [=0]	**M1**	or for correct factors for *their* quadratic equation or for correct use of quadratic formula or completing the square for *their* equation
	[x =] 12 [y =] 5 [x =] –13 [y =] –20	**B2**	**B1** for $x = 12$, $x = -13$ or for $y = 5$, $y = -20$ or for a correct pair of x and y values If B0 scored and at least 2 method marks scored **SC1** for correct substitution of both of *their* x values or *their* y values into $x - y = 7$ or $x^2 + y = 149$

136. 0580_m21_ms_22 Q: 21

Question	Answer	Marks	Partial Marks
(a)	Correct sketch 	**2**	**B1** for one correct branch or attempt at correct shape
(b)	Correct sketch 	**2**	**B1** for correct shape but crossing x-axis or correct shape but just in one quadrant

137. 0580_m21_ms_22 Q: 24

Question	Answer	Marks	Partial Marks
	(0, 5) $\left(\frac{4}{3}, \frac{103}{27}\right)$ oe	5	**B2** for $3x^2 - 4x$ or **B1** for $3x^2$ or $-4x$ **M1** for *their* derivative = 0 oe or $\frac{dy}{dx} = 0$ **B1** for [x =] 0 and $\frac{4}{3}$ or for 1 correct coordinate pair

138. 0580_s21_ms_21 Q: 6

Question	Answer	Marks	Partial Marks
(a)	4 10 18	2	**B1** for 2 correct
(b)	$32 - 7n$ oe final answer	2	**B1** for $32 - kn$ oe $k \neq 0$ *or* $j - 7n$ oe or $32 - 7n$ seen then spoilt

139. 0580_s21_ms_21 Q: 7

Question	Answer	Marks	Partial Marks
	correctly eliminating 1 variable	M1	
	$x = 5$	A1	
	$y = -7$	A1	If M0 scored **SC1** for two values satisfying one of the original equations

140. 0580_s21_ms_21 Q: 11

Question	Answer	Marks	Partial Marks
(a)	$256a^4b^{20}$ final answer	2	**B1** for two correct elements in final answer
(b)	27	1	
(c)	6	2	**M1** for $3^k \div 3^t = 3^2$ or $3^8 \div 3^t = 3^k$ oe or better or $3^t = 729$ oe

141. 0580_s21_ms_21 Q: 14

Question	Answer	Marks	Partial Marks
	24	3	**M1** for $y = k\sqrt{x-3}$ oe **M1** for $y = \textit{their}\ k\sqrt{39-3}$ oe

142. 0580_s21_ms_21 Q: 15

Question	Answer	Marks	Partial Marks
	$\frac{g}{2m+g}$ final answer	4	**M1** for expanding brackets or $\div g$ **M1** for isolating terms in h **M1** for factorising **M1** for dividing by bracket to isolate h Incorrect/unsimplified final answer scores max 3 marks

143. 0580_s21_ms_22 Q: 8

Question	Answer	Marks	Partial Marks
	[±] 7.5 oe	2	**M1** for $5.625 = \frac{b^2}{2\times 5}$ or better

144. 0580_s21_ms_22 Q: 18

Question	Answer	Marks	Partial Marks
	[x =] –2.1 oe	4	**M3** for $x^2 + 10x = x^2 - 21$ or better OR **M1** for $(x + 1 + 4)^2 - 25$ or better **M1** for $x^2 - 25 + 4$ or better If 0 scored **SC1** for answer $-\frac{11}{6}$ oe

145. 0580_s21_ms_22 Q: 20

Question	Answer	Marks	Partial Marks
	$2x^3 + 7x^2 - 7x - 30$ final answer	3	**B2** for unsimplified expansion with at most one error or for simplified four-term expression of correct form with three terms correct or **B1** for correct expansion of two brackets with at least three terms out of four correct

146. 0580_s21_ms_22 Q: 21

Question	Answer	Marks	Partial Marks
(a)	$[F =]\frac{108}{d^2}$ final answer	2	**M1** for $F = \frac{k}{d^2}$ oe or better
(b)	$[n =]\frac{1}{4}$ or 0.25	1	

147. 0580_s21_ms_22 Q: 22

Question	Answer	Marks	Partial Marks
	$\frac{2x+3}{3x}$ final answer	4	**B2** for $(x-4)(2x+3)$ or **B1** for $(x + a)(2x + b)$ where $ab = -12$ or $2a + b = -5$ or $x(2x+3)-4(2x+3)$ or $2x(x-4)+3(x-4)$ **B1** for $3x(x-4)$

148. 0580_s21_ms_22 Q: 24

Question	Answer	Marks	Partial Marks
	$x = 3, x = -3$ nfww	5	**M2** for $x + 9 + 9(x + 1) = (x + 1)(x + 9)$ oe or better or **M1** for $x + 9 + 9(x + 1)$ or $(x + 1)(x + 9)$ oe or better **B1** for $x^2 + x + 9x + 9$ seen **M1 dep** for $[0 =]x^2 - 9$ oe simplified or better

149. 0580_s21_ms_23 Q: 2

Question	Answer	Marks	Partial Marks
(a)	$\frac{18}{25}$ cao	1	
(b)	$\frac{1}{250}$ cao	1	

150. 0580_s21_ms_23 Q: 6

Question	Answer	Marks	Partial Marks
	$100y - np$	2	**B1** for $100y$ seen or for answer $[10^k]\, y - np$

151. 0580_s21_ms_23 Q: 11

Question	Answer	Marks	Partial Marks
	$12x^7$ final answer	2	**B1** for $12x^j$ or kx^7 $(j,k \neq 0)$ as final answer

152. 0580_s21_ms_23 Q: 12

Question	Answer	Marks	Partial Marks
	–1, 0, 1 final answer	2	**B1** for $-1 \leqslant x < 2$ or two correct answers and no extras or three correct answers and one extra/wrong

153. 0580_s21_ms_23 Q: 13

Question	Answer	Marks	Partial Marks
	$4t$ final answer	**2**	**B1** for $6t - 6q$ or $-2t + 6q$ or $2t - 6q$ or for $4t$ or $0q$ in the final answer

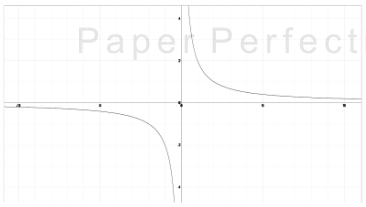
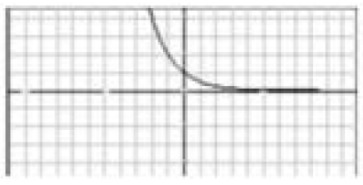
154. 0580_s21_ms_23 Q: 18

Question	Answer	Marks	Partial Marks
(a)	12	**1**	
(b)	144	**2**	**FT** $12 \times$ *their V* **M1** for any relevant area **FT** *their V*

155. 0580_s21_ms_23 Q: 22

Question	Answer	Marks	Partial Marks
	$\frac{81}{(y-2)^2}$ final answer	**2**	**M1** for $z = \frac{k}{(y-2)^2}$ oe or better

156. 0580_s21_ms_23 Q: 24

Question	Answer	Marks	Partial Marks
(a)	Correct sketch 	**2**	**B1** for one correct branch or attempt at correct shape
(b)	Correct sketch 	**2**	**B1** for correct shape but crossing x-axis or for correct shape but just drawn in one quadrant

157. 0580_s21_ms_23 Q: 25

Question	Answer	Marks	Partial Marks
	0 and 4 final answer	4	**B3** for $5x^3(x-4)$ or better or **B2** for $5x^4 - 20x^3$ or **B1** for $5x^4$ or $-20x^3$

158. 0580_w21_ms_21 Q: 8

Question	Answer	Marks	Partial Marks
	Correctly eliminates one variable	M1	
	$[x =] -3$, $[y =] 0.5$ oe	A2	**A1** for either correct If M0 scored, **SC1** for 2 values satisfying one of the original equations If 0 scored, **SC1** for correct answers from no working

159. 0580_w21_ms_21 Q: 13

Question	Answer	Marks	Partial Marks
	$x \leqslant 1$ final answer	3	**M1** for $20 - 15x \geqslant 6 - x$ or $4 - 3x \geqslant \frac{6}{5} - \frac{x}{5}$ **M1** for correctly isolating terms in x FT *their* first step of dealing with the 5 $20 - 6 \geqslant -x + 15x$ or $-3x + \frac{x}{5} \geqslant \frac{6}{5} - 4$

160. 0580_w21_ms_21 Q: 14

Question	Answer	Marks	Partial Marks
	38	3	**M2** for $12\times\sqrt{4.25-2}=3\times\sqrt{x-2}$ OR **M1** for $y=\frac{k}{\sqrt{x-2}}$ oe **M1** for $3=\frac{their\ k}{\sqrt{x-2}}$ oe

161. 0580_w21_ms_21 Q: 16

Question	Answer	Marks	Partial Marks
(a)	$n^3 + 7$ oe final answer	2	**B1** for any cubic or for 3rd differences of 6
(b)	$\frac{n+1}{4^{n-1}}$ oe final answer	3	**B1** for $n + 1$ **B2** for 4^{n-1} oe or **B1** for 4^{n-k} oe k can be 0 Maximum 2 marks if not correctly combined as a fraction

162. 0580_w21_ms_21 Q: 17

Question	Answer	Marks	Partial Marks
	$[x =]\ \frac{y+2}{y+3}$ oe final answer	4	**M1** $y\,(1-x) = 3x - 2$ or better **M1** for correctly isolating x terms on one side FT *their* first step/bracket expansion **M1dep** for correctly removing factor of x FT *their* previous step **M1dep** for correct division to isolate x Max 3 marks for an incorrect answer

163. 0580_w21_ms_21 Q: 19

Question	Answer	Marks	Partial Marks
	$\frac{8-5x-x^2}{7(x+3)}$ or $\frac{8-5x-x^2}{7x+21}$ final answer	**3**	**B1** for $7 \times 2 - (x + 2)(x + 3)$ or better seen **B1** for common denominator $7(x + 3)$ oe isw

164. 0580_w21_ms_21 Q: 22

Question	Answer	Marks	Partial Marks
(a)	x^{-2} or $\frac{1}{x^2}$ final answer	**1**	
(b)	$\frac{2}{3}$	**1**	
(c)	1 nfww	**3**	**M1** for $3^{-2(4-3x)}$ oe or better or $9^{\frac{3x}{2}} \times 9^{-(4-3x)} = 9^{\frac{1}{2}}$ oe or better **M1** for $3x + (their - 2) \times (4 - 3x) = 1$ oe or better or $their\frac{3x}{2} - (4-3x) = their\frac{1}{2}$ oe or better

165. 0580_w21_ms_22 Q: 5

Question	Answer	Marks	Partial Marks
	12	**3**	**M2** for $(95.25 - 15.5) \div 7.25$ oe or $(95.25 - (15.5 - 7.25)) \div 7.25$ oe or **M1** for $95.25 - 15.5$ or **B1** for 79.75

166. 0580_w21_ms_22 Q: 11

Question	Answer	Marks	Partial Marks
	Straight line from (20, 14) to (35, 14) and straight line from (35, 14) to (45, 0)	3	**M1** for 210 ÷ 14 soi **M1** for 14 ÷ 1.4 or any line with gradient –1.4 ending at x axis

167. 0580_w21_ms_22 Q: 12

Question	Answer	Marks	Partial Marks
	$13 - 5n$ oe final answer $\frac{n+1}{n}$ oe final answer 2^{n-2} oe final answer	5	**B2** for $13 - 5n$ oe final answer or **B1** for $-5n + c$ or $13 - kn$ $k \neq 0$ or $13 - 5n$ seen then spoilt **B1** for $\frac{n+1}{n}$ oe final answer **B2** for 2^{n-2} oe final answer or **B1** for 2^{n-k} oe k can be 0

168. 0580_w21_ms_22 Q: 17

Question	Answer	Marks	Partial Marks
	$\frac{3}{5}$ oe and $-\frac{7}{2}$ oe	1	

169. 0580_w21_ms_22 Q: 18

Question	Answer	Marks	Partial Marks
	$x^2 - 11x + 24$ [= 0] or $y^2 - 16y + 39$ [= 0]	**M2**	**M1** for $x^2 - 9x + 21 = 2x - 3$ oe or $y = \left(\frac{y+3}{2}\right)^2 - 9\left(\frac{y+3}{2}\right) + 21$ oe
	$(x - 8)(x - 3)$ [= 0] or $(y - 13)(y - 3)$ [= 0]	**M1**	or for correct factors for *their* quadratic equation or for correct use of quadratic formula for *their* equation
	[x =] 3 [y =] 3 [x =] 8 [y =] 13	**B2**	**B1** for one correct pair or two correct x values or two correct y values. If B0 scored **and** at least 2 method marks scored **SC1** for correct substitution of both of *their* x values or *their* y values into $y = x^2 - 9x + 21$ or $y = 2x - 3$

170. 0580_w21_ms_22 Q: 20

Question	Answer	Marks	Partial Marks
(a)	32	**2**	**M1** for f(6) = 8 or $\text{ff}(x) = 2^{\left(2^{x-3}\right)-3}$ oe

Question	Answer	Marks	Partial Marks
(b)	$x + 21$	**1**	
(c)	–1	**2**	**M1** for $\frac{1}{16}$ oe or 2^{-4} oe

171. 0580_w21_ms_22 Q: 21

Question	Answer	Marks	Partial Marks
	$2x^3 - 7x^2 - 12x + 45$ final answer	3	**B2** for unsimplified expansion of the three brackets with at most one error or for simplified four-term expression of correct form with three terms correct or **B1** for correct expansion of two of the given brackets with at least three terms out of four correct

172. 0580_w21_ms_22 Q: 23

Question	Answer	Marks	Partial Marks
	$\frac{3y-5}{2(x-12)}$ or $\frac{3y-5}{2x-24}$ final answer	4	**SC3** for answer $\frac{3y-5}{x-12}$ or **B3** for $(3y-5)(x+12)$ **and** $2(x-12)(x+12)$ or $(2x-24)(x+12)$ or **B2** for $(3y-5)(x+12)$ or $2(x-12)(x+12)$ or $(2x-24)(x+12)$ or $(2x+24)(x-12)$ or **B1** for $3y(x+12)-5(x+12)$ or $x(3y-5)+12(3y-5)$ or $2(x^2-144)$ or $(x-12)(x+12)$

173. 0580_w21_ms_23 Q: 7

Question	Answer	Marks	Partial Marks
	$8g^{28}$ final answer	2	**B1** for kg^{28} or $8g^k$ as final answer or correct answer seen and spoilt

174. 0580_w21_ms_23 Q: 10

Question	Answer	Marks	Partial Marks
(a)	–13	**1**	
(b)	$-4n + 7$ oe final answer	**2**	**B1** for $-4n + k$ or $jn + 7$ ($j \neq 0$) or for a correct answer spoilt

175. 0580_w21_ms_23 Q: 11

Question	Answer	Marks	Partial Marks
(a)	2925	**2**	**M1** for $100(3^2 + 4.5^2)$ or **B1** for 29.25 seen
(b)	$[\pm]\sqrt{\frac{P}{M} - h^2}$ or $[\pm]\sqrt{\frac{P - Mh^2}{M}}$ final answer	**3**	**M1** for correct division by M **M1** for correct re-arrangement to isolate g or g^2 **M1** for correct square root of two term expression Max **2** marks for an incorrect answer

176. 0580_w21_ms_23 Q: 21

Question	Answer	Marks	Partial Marks
	$27y^6$ final answer	**2**	**B1** for ky^6 or $27y^k$ as final answer or correct answer seen and spoilt

177. 0580_w21_ms_23 Q: 22

Question	Answer	Marks	Partial Marks
	$x^2 - 4x - 12$ [= 0] or $y^2 - 2y - 15$ [= 0]	**M2**	**M1** for $x^2 - 3x - 13 = x - 1$ or for $y = (y + 1)^2 - 3(y + 1) - 13$
	$(x - 6)(x + 2)$ [= 0] or $(y - 5)(y + 3)$ [= 0]	**M1**	or for correct factors for *their* quadratic equation or for correct use of quadratic formula or completing the square for *their* equation
	[x =] 6, [y =] 5 [x =] –2, [y =] –3	**B2**	**B1** for one correct pair or two correct x values or two correct y values If **B0** scored **and** at least 2 method marks scored **SC1** for correct substitution of both of *their* x values or *their* y values into $y = x^2 - 3x - 13$ or $y = x - 1$

178. 0580_w21_ms_23 Q: 25

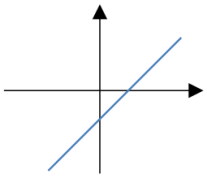
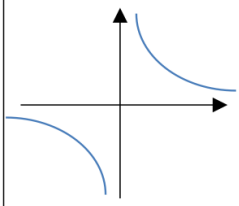
Question	Answer	Marks	Partial Marks
	$\frac{3x}{a+2c}$ final answer	**4**	**B1** for $3x(x - 6)$ **B2** for $(x-6)(a+2c)$ or **B1** for $a(x-6)+2c(x-6)$ or $x(a+2c)-6(a+2c)$

179. 0580_m20_ms_22 Q: 9

Question	Answer	Marks	Partial Marks
(a)	$3x(x-4y)$ final answer	**2**	**B1** for $3(x^2-4xy)$ or $x(3x-12y)$

Question	Answer	Marks	Partial Marks
(b)	m^2-m-6 final answer	**2**	**M1** for 3 terms from $m^2, -3m, +2m, -6$

180. 0580_m20_ms_22 Q: 10

Question	Answer	Marks	Partial Marks
(a)	Correct sketch 	1	Line with positive gradient and negative y intercept
(b)	Correct sketch 	2	**B1** for only one branch or attempt at correct shape

181. 0580_m20_ms_22 Q: 16

Question	Answer	Marks	Partial Marks
	$8y^2 - 42y + 10[=0]$ or $8x^2 + 14x - 400[=0]$	M3	**M1** for $(7-3y)^2 - y^2 = 39$ oe or $x^2 - \left(\frac{7-x}{3}\right)^2 = 39$ oe **M1** for $49 - 21y - 21y + 9y^2$ or better or $49 - 7x - 7x + x^2$ or better or for correct expansion of their quadratic binomial
	$(8y-2)(y-5)[=0]$ oe $(8x-50)(x+8)[=0]$ oe	M1	**M1** for correct method to solve *their* quadratic equation e.g. factors, quadratic formula, completing the square
	$x = 6.25$ oe $y = 0.25$ oe $x = -8$ $y = 5$	B2	**B1** for $x = 6.25$, $x = -8$ or for $y = 0.25$, $y = 5$ or for a correct pair of x and y values

182. 0580_m20_ms_22 Q: 20

Question	Answer	Marks	Partial Marks
	$[a =]$ 36 $[b =] -6$	2	**B1** for each or **SC1** for correct answers reversed

183. 0580_P20_ms_20 Q: 5

	Answer	Mark	Partial Marks
	11	2	**M1** for $-2 \times -7 - 3$ soi

184. 0580_P20_ms_20 Q: 9

	Answer	Mark	Partial Marks
	$w = \frac{3y-7}{5}$ oe	2	**M1** for $5w + 7 = 3y$ or $5w - 3y = -7$ or $5w = 3y - 7$ or $w - \frac{3y}{5} + \frac{7}{5} = 0$

185. 0580_P20_ms_20 Q: 13

	Answer	Mark	Partial Marks
	$n > 3.75$	2	**M1** for $7 + 8 < 5n - n$ oe allow 3¾

186. 0580_P20_ms_20 Q: 15

	Answer	Mark	Partial Marks
(a)	-3	1	
(b)	$9 - 2n$ oe	2	**B1** for $-2n + k$ or $dn + 9$ where $d \neq 0$

187. 0580_P20_ms_20 Q: 21

	Answer	Mark	Partial Marks
	A C D	3	**B1** for each

188. 0580_P20_ms_20 Q: 25

	Answer	Mark	Partial Marks
	$(x + 2)^2$ or $x^2 + 2ax + a^2 - b$	M1	
	$-3 - (their\ 2)^2$ or $a^2 - b = -3$ or $2a = 4$	M1	
	$(x + 2)^2 - 7$ or $a = 2$ and $b = 7$	M1	
	$(-2, -7)$	B1	

189. 0580_P20_ms_20 Q: 27

	Answer	Mark	Partial Marks
(a)	$3x^2$	2	**B1** for $3x^k$ or kx^2 ($k \neq 0$)
(b)	32	3	**M2** for $8x^2$ and $\frac{4}{x^2}$ or **B1** for $8x^2$ or $\frac{4}{x^2}$

190. 0580_P20_ms_20 Q: 28

	Answer	Mark	Partial Marks
	$5x^2 + 4x - 19 = 4x + 1$	M1	For subtracting the two equations
	$5x^2 - 20 = 0$	M1	Alternative method $5x^2 = 20$
	[5] $(x - 2)(x + 2)$ [= 0]	M1	$x^2 = 4$
	$x = 2$ and -2	B1	
	$y = 9$ and -7	B1	

191. 0580_s20_ms_21 Q: 5

	Answer	Marks	Partial Marks
(a)	52	1	
(b)	$7n + 5$ oe final answer	2	**B1** for $7n + a$ or $bn + 5$ $b \neq 0$

192. 0580_s20_ms_21 Q: 9

	Answer	Marks	Partial Marks
(a)	$7a(3a + 4b)$ final answer	2	**B1** for partial factorisation $7(3a^2 + 4ab)$ or $a(21a + 28b)$
(b)	$5(2x + 3y)(2x - 3y)$ final answer	3	**B2** for $(2x + 3y)(2x - 3y)$ or $(10x + 15y)(2x - 3y)$ or $(2x + 3y)(10x - 15y)$ or **B1** for $5(4x^2 - 9y^2)$

193. 0580_s20_ms_21 Q: 11

	Answer	Marks	Partial Marks
	990	3	**M2** for correct complete area statement e.g. $\frac{1}{2} \times 30 \times (6 + 12) + 60 \times 12$ oe or **M1** for one area calculation

194. 0580_s20_ms_21 Q: 14

	Answer	Marks	Partial Marks
(a)	$[p =] -13$	2	**M1** for $4(5x - 4) + 3$ or better
(b)	$\frac{3x+1}{5}$	3	**M2** for $x = \frac{3y+1}{5}$, $5y = 3x + 1$ or $y - \frac{1}{5} = \frac{3x}{5}$ **M1** for $x = \frac{5y-1}{3}$, $3y = 5x - 1$ or $y + \frac{1}{3} = \frac{5x}{3}$

195. 0580_s20_ms_21 Q: 16

	Answer	Marks	Partial Marks
	1.8 or $1\frac{4}{5}$	3	**M2** for $m = \frac{k}{(p-1)^2}$ or **M1** for $m = \frac{theirk}{(6-1)^2}$ OR **M2** for $5(4-1)^2 = m(6-1)^2$ oe

196. 0580_s20_ms_21 Q: 21

	Answer	Marks	Partial Marks
	$3x^3 - 7x^2 - 43x + 15$	3	**B2** for correct expansion and simplification of two of the brackets or **B1** for correct expansion of two brackets with at least 3 terms correct

197. 0580_s20_ms_22 Q: 5

	Answer	Marks	Partial Marks
	–2	2	**M1** for (–3)(–2) + (–8)

198. 0580_s20_ms_22 Q: 10

	Answer	Marks	Partial Marks
	$\frac{2p^2}{t}$	2	**B1** for correct unsimplified answer

199. 0580_s20_ms_22 Q: 13

	Answer	Marks	Partial Marks
	$2t^4$	2	**B1** for $2t^n$ or kt^4 $(n,k \neq 0)$

200. 0580_s20_ms_22 Q: 14

	Answer	Marks	Partial Marks
	–14	2	**M1** for $1 - x = 3 \times 5$ or better or $\frac{x}{3} = 5 - \frac{1}{3}$ or better

201. 0580_s20_ms_22 Q: 19

	Answer	Marks	Partial Marks
	$[\pm]\sqrt{\frac{h^2 - x^2}{2}}$	3	**M1** for correct rearrangement for y or y^2 term **M1** for correct square root **M1** for correct division by 2 or $\sqrt{2}$

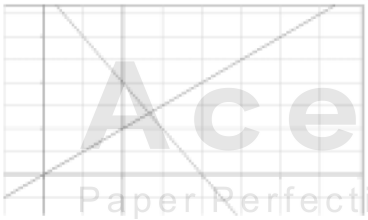
202. 0580_s20_ms_22 Q: 21

	Answer	Marks	Partial Marks
(a)	$125x^{12}$	2	**B1** for $125x^k$ or kx^{12}
(b)	$8x^{96}$	2	**B1** for $8x^k$ or kx^{96}

203. 0580_s20_ms_22 Q: 22

	Answer	Marks	Partial Marks
	16	3	**M1** for $p = k(q+2)^2$ **M1** for $p = (their\ k)(10+2)^2$ OR **M2** for $\frac{p}{(10+2)^2} = \frac{1}{(1+2)^2}$ oe

204. 0580_s20_ms_22 Q: 23

	Answer	Marks	Partial Marks
(a)	Correct lines and correct region clear 	5	**B2** for $2x + y = 8$ correctly ruled or **B1** for ruled line with negative gradient **B1** for $y = x$ correctly ruled **B1** for $x = 2$ correctly ruled
(b)	6	1	

205. 0580_s20_ms_22 Q: 25

	Answer	Marks	Partial Marks
	$\frac{2x-5}{a-2b}$ final answer	5	**B2** for $(2x-5)(x+3)$ or **B1** for $(2x+p)(x+q)$ where $pq = -15$ or $p + 2q = 1$ **B2** for $(x+3)(a-2b)$ or **B1** for $x(a-2b) + 3(a-2b)$ or $a(x+3) - 2b(x+3)$

206. 0580_s20_ms_22 Q: 26

	Answer	Marks	Partial Marks
	4	2	**M1** for $y^{\frac{2}{3}} = x^{\frac{1}{6}}$ or $y^2 = \sqrt{x}$ or $y^4 = x$

207. 0580_s20_ms_23 Q: 6

Question	Answer	Marks	Partial Marks
(a)	p^6	1	
(b)	m^{10}	1	
(c)	k^{15}	1	

208. 0580_s20_ms_23 Q: 11

	Answer	Marks	Partial Marks
	[y =] 1	3	**M1** for $y = k \times \sqrt[3]{x+3}$ **M1** for $y = \text{their } k \times \sqrt[3]{24+3}$ OR **M2** for $\frac{y}{\sqrt[3]{24+3}} = \frac{2}{3} \times \frac{1}{\sqrt[3]{5+3}}$ oe

209. 0580_s20_ms_23 Q: 13

	Answer	Marks	Partial Marks
	$x + y < 4$ $y \geqslant 1.5$ $y \leqslant 2x + 1$	4	**B3** for any two correct or **B1** for $y \geqslant 1.5$ **B2** for $x + y < 4$ or $y \leqslant 2x + 1$ or $x + y = 4$ and $y = 2x + 1$ or with incorrect inequality signs or **B1** for $x + y = 4$ or $y = 2x + 1$ or **SC3** for > instead of $\geqslant$ etc.

210. 0580_s20_ms_23 Q: 14

	Answer	Marks	Partial Marks
(a)	0.3 oe	1	
(b)	3060	3	**M2** for $\frac{1}{2}(300+210)\times 12$ oe or **M1** for one correct part area

211. 0580_s20_ms_23 Q: 18

	Answer	Marks	Partial Marks
(a)	$(x-9)^2-108$	2	**B1** for $(x+h)^2-108$ or $(x-9)^2+h$ or $k=-9$
(b)	19.4 or 19.39… −1.39 or −1.392…	2	**M1FT** $x - their 9 = \pm\sqrt{their 108}$ **A1** for $9\pm\sqrt{108}$ or $9\pm 6\sqrt{3}$

212. 0580_w20_ms_21 Q: 1

Question	Answer	Marks	Partial Marks
	$-a + 8b$ final answer	2	**B1** for $-a$ or [+]$8b$ in final answer or for $-a + 8b$ spoilt

213. 0580_w20_ms_21 Q: 3

Question	Answer	Marks	Partial Marks
	1.75	3	**M2** for $(13.72 - 2.8\times 2.65)\div 3.6$ oe or **M1** for 2.8×2.65

214. 0580_w20_ms_21 Q: 7

Question	Answer	Marks	Partial Marks
	$[x=]\frac{2y+7}{5}$ oe or $[x=]\frac{2y}{5}+\frac{7}{5}$ oe final answer	2	**M1** for $2y+7=5x$ oe or $\frac{2y}{5}=x-\frac{7}{5}$ oe

215. 0580_w20_ms_21 Q: 15

Question	Answer	Marks	Partial Marks
(a)	0.3	1	
(b)	360	3	**M2** for correct complete area statement e.g. $18\times60+\frac{1}{2}\times40\times(18+6)-12\times100$ or $\frac{1}{2}\times6\times(60+80)-\frac{1}{2}\times6\times20$ or for answer 420 or **M1** for one area calculation

216. 0580_w20_ms_21 Q: 16

Question	Answer	Marks	Partial Marks
	$(3x-4)(2x+5)$ final answer	2	**B1** for $(ax+b)(cx+d)$ where $ac=6$ and $ad+bc=7$ or $bd=-20$

217. 0580_w20_ms_21 Q: 17

Question	Answer	Marks	Partial Marks
(a)	$[a=]\ 7$	2	**M1** for $3(-2)^2+a=19$ or better
(b)(i)	$6x-9$ or $3(2x-3)$ final answer	2	**M1** for $2(3x-8)+7$ or better
(b)(ii)	$\frac{x-7}{2}$ final answer	2	**M1** for a correct first step $x=2y+7$ or $y-7=2x$ or $\frac{y}{2}=x+\frac{7}{2}$

218. 0580_w20_ms_21 Q: 22

Question	Answer	Marks	Partial Marks
	$\frac{x}{2(x+5)}$ or $\frac{x}{2x+10}$ final answer	4	**B1** for $x(x-5)$ **B2** for $2(x-5)(x+5)$ or $(x-5)(2x+10)$ or $(2x-10)(x+5)$ or **B1** for $2(x^2-25)$ or $(x-5)(x+5)$

219. 0580_w20_ms_22 Q: 3

Question	Answer	Marks	Partial Marks
	1.2 or $1\frac{1}{5}$ or $\frac{6}{5}$	2	**M1** for $6 = 2x + 3x$ or better

220. 0580_w20_ms_22 Q: 6

Question	Answer	Marks	Partial Marks
	$4(1-2x)$	1	

221. 0580_w20_ms_22 Q: 9

Question	Answer	Marks	Partial Marks
	[x =] 3 [y =] 1	2	**B1** for each

222. 0580_w20_ms_22 Q: 11

Question	Answer	Marks	Partial Marks
	$10x^7$ final answer	2	**B1** for kx^7 or $10x^k$ final answer or for correct answer then spoilt

223. 0580_w20_ms_22 Q: 17

Question	Answer	Marks	Partial Marks
(a)	0.1 or $\frac{1}{10}$	1	
(b)	90	3	**M2** for $\frac{1}{2}\times10\times2+10\times2+\frac{1}{2}(2+4)\times20$ oe or **M1** for one area calculation or indicated on diagram

224. 0580_w20_ms_22 Q: 21

Question	Answer	Marks	Partial Marks
(a)	$4-2x$	2	**B1** for 4 or $-2x$
(b)	(2, 10)	2	**B1** for x-coordinate of 2 or **M1** for *their* $4-2x=0$

225. 0580_w20_ms_22 Q: 23

Question	Answer	Marks	Partial Marks
	$\frac{3}{x+1}$ final answer	3	**B1** for $2(x+1)-(2x-1)$ oe **B1** for common denominator $x+1$

226. 0580_w20_ms_22 Q: 26

Question	Answer	Marks	Partial Marks
	$\frac{x-2}{u+1}$ oe final answer	4	**B2** for $(x-2)(u-1)$ or **B1** for $u(x-2)-(x-2)$ or $x(u-1)-2(u-1)$ **B1** for $(u-1)(u+1)$

227. 0580_w20_ms_23 Q: 4

Question	Answer	Marks	Partial Marks
	a^{-4} or $\frac{1}{a^4}$ final answer	1	

228. 0580_w20_ms_23 Q: 10

Question	Answer	Marks	Partial Marks
	Correctly eliminates one variable	M1	
	$[x =]$ 6 $[y =]$ –0.5 oe	A2	**A1** for either correct If M0 scored, **SC1** for 2 values satisfying one of the original equations

229. 0580_w20_ms_23 Q: 15

Question	Answer	Marks	Partial Marks
	$[x =] y(m - 2p)^2$ nfww or $[x =] y(m^2 - 4mp + 4p^2)$ final answer	3	**M1** for subtract $2p$ or *their* term in p to isolate a term in x **M1** for squaring **M1** for multiplying by *their* term in y Maximum of 2 marks for an incorrect answer

230. 0580_w20_ms_23 Q: 18

Question	Answer	Marks	Partial Marks
(a)	$64x^3y^6$ final answer	2	**B1** for kx^3y^6 or $64x^ky^6$ or $64x^3y^k$ final answer or correct answer then spoilt
(b)	$\frac{2}{3}$	1	

231. 0580_w20_ms_23 Q: 19

Question	Answer	Marks	Partial Marks
(a)	$\frac{5}{12}$ or 0.417 or 0.4166 to 0.4167	1	
(b)	32.5	4	**M3** for $\frac{1}{2}(v+v+10)\times 24+\frac{1}{2}\times 16(v+10)=1240$ oe OR **M2** for $\frac{1}{2}(v+v+10)\times 24$ oe and $\frac{1}{2}\times 16(v+10)$ oe or **M1** for one area expression **M1** for correctly solving *their* $(av + b = 1240)$ oe $(a \neq 0, b \neq 0)$

232. 0580_w20_ms_23 Q: 20

Question	Answer	Marks	Partial Marks
	$(3x + 8y)(1 - 2a)$	2	**M1** for $3x(1 - 2a) + 8y(1 - 2a)$ or $3x + 8y - 2a(3x + 8y)$ or better

233. 0580_w20_ms_23 Q: 23

Question	Answer	Marks	Partial Marks
	$y=\frac{10.5}{\sqrt{x}}$ oe final answer	2	**M1** for $y=\frac{k}{\sqrt{x}}$

234. 0580_w20_ms_23 Q: 24

Question	Answer	Marks	Partial Marks
	$\frac{x+5}{x-12}$ nfww final answer	4	**B1** for $(x + 5)(x - 5)$ **B2** for $(x - 12)(x - 5)$ or **B1** for $x(x - 5) - 12(x - 5)$ or $x(x - 12) - 5(x - 12)$ or for $(x + a)(x + b)$ where $ab = -60$ or $a + b = -17$

235. 0580_m19_ms_22 Q: 9

	Answer	Mark	Partial Marks
	$[y =]\frac{1}{4}(x-4)$ oe final answer	2	**M1** for $y = k(x - 4)$

236. 0580_m19_ms_22 Q: 13

	Answer	Mark	Partial Marks
(a)	$k(7k - 15)$ final answer	1	
(b)	$4(m + p)(3 + 2m + 2p)$ final answer	2	**B1** for $(m + p)(12 + 8(m + p))$ or $(m + p)(12 + 8m + 8p)$ or $(4m + 4p)(3 + 2m + 2p)$ or $(2m + 2p)(6 + 4m + 4p)$ or $2(2m + 2p)(3 + 2m + 2p)$ or $2(m + p)(6 + 4m + 4p)$

237. 0580_m19_ms_22 Q: 16

	Answer	Mark	Partial Marks
	tangent ruled at $x = 2$	B1	
	–0.7 to –0.3	B2	**dep on B1** or a close attempt at tangent at $x = 2$ or **M1** for rise/run for their tangent at $x = 2$ must see correct or implied calculation from a drawn tangent

238. 0580_m19_ms_22 Q: 17

	Answer	Mark	Partial Marks
(a)	-3	1	
(b)	$\frac{m}{4}$ or $0.25m$ final answer	2	**B1** for $\frac{1}{4}$ or 0.25 or 4^{-1} or m correct in final answer

239. 0580_m19_ms_22 Q: 19

	Answer	Mark	Partial Marks
	$\frac{b}{a+b}$ final answer	3	**B1** for $b(a-b)$ **B1** for $(a+b)(a-b)$

240. 0580_m19_ms_22 Q: 22

	Answer	Mark	Partial Marks
(a)	$1\frac{2}{3}$ or 1.67 or 1.666 to 1.667	1	
(b)	1062.5	3	**M2** for $\frac{25}{2}(50+35)$ oe or **M1** for one area

241. 0580_s19_ms_21 Q: 2

	Answer	Mark	Partial Marks
	$y(5-6p)$ final answer	1	

242. 0580_s19_ms_21 Q: 3

	Answer	Mark	Partial Marks
	4.01 or 4.007 to 4.008	1	

243. 0580_s19_ms_21 Q: 6

	Answer	Mark	Partial Marks
(a)	t^{14} final answer	**1**	
(b)	u^{25} final answer	**1**	

244. 0580_s19_ms_21 Q: 10

	Answer	Mark	Partial Marks
	$5 - 2x$ final answer	**2**	**M1** for $2(1 - x) + 3$ oe

245. 0580_s19_ms_21 Q: 13

	Answer	Mark	Partial Marks
	[a =] 2 [b =] – 13	**3**	**B2** for either correct or $(x + 2)^2 - 13$ OR **M1** for $2a = 4$ soi **M1** for $a^2 + b = -9$ soi OR **M1** for $x^2 + ax + ax + a^2$ [$+b$] or better

246. 0580_s19_ms_21 Q: 15

	Answer	Mark	Partial Marks
	$3x^2 - 3x + 2$ final answer	**3**	**B2** for $x^2 + 2x + x + 2 + 2x^2 - 6x$ oe or **B1** for 3 correct terms of $x^2 + 2x + x + 2$ oe

247. 0580_s19_ms_21 Q: 16

	Answer	Mark	Partial Marks
	[±] 0.6 oe	3	**M1** for $y = \frac{k}{\sqrt{x+1}}$ **M1** for $y = \frac{theirk}{\sqrt{99+1}}$ OR **M2** for $\frac{2\sqrt{8+1}}{\sqrt{99+1}}$ or **M1** for $2\sqrt{8+1} = y\sqrt{99+1}$

248. 0580_s19_ms_21 Q: 17

	Answer	Mark	Partial Marks
(a)	$(p-q)(p+q)$ final answer	1	
(b)	$\frac{7}{2}$ oe	2	**M1** for $2 \times (p+q) = 7$ or for $(2+q)^2 - q^2 = 7$ or $p^2 - (p-2)^2 = 7$

249. 0580_s19_ms_21 Q: 18

	Answer	Mark	Partial Marks
(a)	$27y^{12}$ final answer	2	**B1** for ky^{12} or $27y^k$ in final answer
(b)	$\frac{3}{2}$ oe	1	

250. 0580_s19_ms_21 Q: 20

	Answer	Mark	Partial Marks
	$\frac{x-5}{(x+2)(3x-1)}$ final answer	3	**B1** for common denominator isw expansion **M1** for $3x - 1 - 2(x+2)$ or better

251. 0580_s19_ms_21 Q: 22

	Answer	Mark	Partial Marks
(a)(i)	17	**1**	
(a)(ii)	$3n + 2$ oe final answer	**2**	**B1** for $3n + k$ or $cn + 2$, $c \neq 0$
(b)	$\frac{31}{12}$ oe	**1**	

252. 0580_s19_ms_21 Q: 24

	Answer	Mark	Partial Marks
(a)	2	**1**	
(b)	1300	**3**	**M2** for $\frac{20}{2} \times (60 + 70)$ oe or **M1** for any relevant area

253. 0580_s19_ms_22 Q: 6

	Answer	Mark	Partial Marks
	2	**2**	**M1** for $9f - 3f$ oe or $23 - 11$ oe

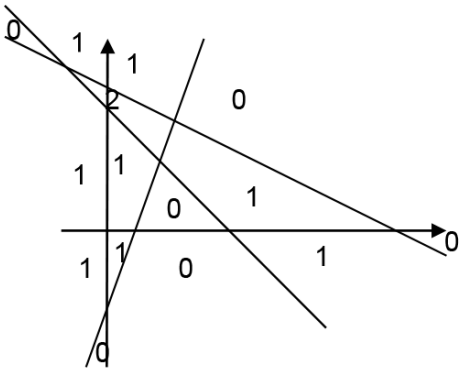
254. 0580_s19_ms_22 Q: 12

	Answer	Mark	Partial Marks
(a)	$10m^5$ final answer	**2**	**B1** for $10m^k$ or km^5 as final answer
(b)	x^{24} final answer	**1**	

255. 0580_s19_ms_22 Q: 14

	Answer	Mark	Partial Marks
	Correctly eliminating one variable	**M1**	
	$[x =] -4$ $[y =] 3$	**A2**	**A1** for one correct If **M0** scored, **SC1** for 2 values satisfying one of the original equations

256. 0580_s19_ms_22 Q: 16

	Answer	Mark	Partial Marks
(a)	*R* identified correctly	**2**	**B** marks 
(b)	7	**1**	

257. 0580_s19_ms_22 Q: 17

	Answer	Mark	Partial Marks
	$\frac{3x^2-4x+9}{(x+3)(x-5)}$ final answer	**3**	**B1** for common denominator $(x+3)(x-5)$ oe isw **M1** for $2x(x-5)+(x+3)(x+3)$ or better

258. 0580_s19_ms_22 Q: 19

	Answer	Mark	Partial Marks
	$m = \frac{k}{P-1}$ final answer	4	**B3** for final answer $\frac{k}{P-1}$ OR **M1** for multiplying or dividing by m correctly **M1** for term(s) in m on one side correctly and terms not in m on the other side correctly **M1** for correctly factorising m with a 2-term bracket oe **M1** for correct division by *their* 2-term bracket with m as the subject To a maximum of **M3** for an incorrect answer

259. 0580_s19_ms_22 Q: 20

	Answer	Mark	Partial Marks
	$\frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-10)}}{2 \times 3}$	B2	**B1** for $\sqrt{(-2)^2 - 4(3)(-10)}$ or better and if in form $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ then **B1** for $p = -(-2)$ and $r = 2(3)$
	−1.52 and 2.19 final ans cao	B1B1	If B0B0, **SC1** for −1.5 and 2.2 or −1.523 to −1.522... and 2.189.... or 1.52 and −2.19 or −1.52 and 2.19 seen in working

260. 0580_s19_ms_23 Q: 2

	Answer	Mark	Partial Marks
	$x(2x - 1)$	1	

261. 0580_s19_ms_23 Q: 10

	Answer	Mark	Partial Marks
	$[w =]\ \frac{P}{2} - h$ or $\frac{P-2h}{2}$ final answer	2	**M1** for $w + h = \frac{P}{2}$ or $2w + 2h = P$

262. 0580_s19_ms_23 Q: 11

	Answer	Mark	Partial Marks
	$2m + 1$	2	**B1** for $2m + c$ or $km + 1$ $(k \neq 0)$

263. 0580_s19_ms_23 Q: 14

	Answer	Mark	Partial Marks
(a)	3	2	**M1** for $a \times 7^2 + a = 150$ oe
(b)	–7	1	

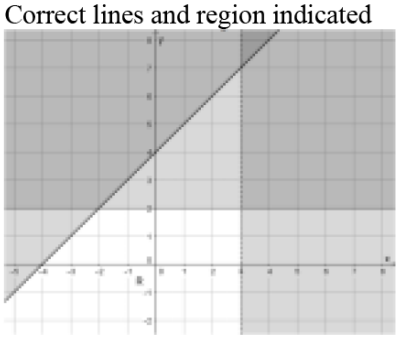
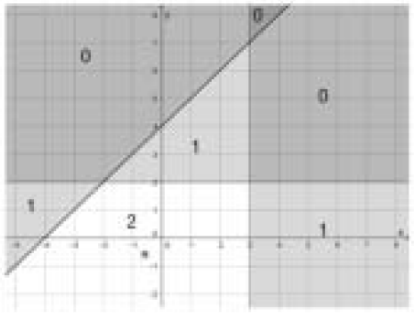
264. 0580_s19_ms_23 Q: 17

	Answer	Mark	Partial Marks
	$\frac{x^2}{x-5}$ final answer	3	**B1** for $x^2(x + 5)$ **B1** for $(x - 5)(x + 5)$

265. 0580_s19_ms_23 Q: 18

	Answer	Mark	Partial Marks
	0.14 oe	3	**M1** for $y = \frac{k}{(x+1)^2}$ **M1** for $y = \frac{their\ k}{(4+1)^2}$ OR **M2** for $\frac{0.875(1+1)^2}{(4+1)^2}$ or **M1** for $y(4 + 1)^2 = 0.875(1 + 1)^2$

266. 0580_s19_ms_23 Q: 24

	Answer	Mark	Partial Marks
	Correct lines and region indicated 	5	**B1** for $y = 2$ solid line **B1** for $x = 3$ dashed line **B1** for $y = x + 4$ solid line **B2, B1 or B0** for region 

267. 0580_w19_ms_21 Q: 2

	Answer	Mark	Partial Marks
	$p(5 + t)$ final answer	1	

268. 0580_w19_ms_21 Q: 5

	Answer	Mark	Partial Marks
	$3c - 4d$ final answer	2	**B1** for $3c + kd$ or $kc - 4d$

269. 0580_w19_ms_21 Q: 6

	Answer	Mark	Partial Marks
	11	2	**M1** for $x - 2 = 3 \times 3$ oe or $\frac{x}{3} = 3 + \frac{2}{3}$ oe or better

270. 0580_w19_ms_21 Q: 7

	Answer	Mark	Partial Marks
	$6x^5$ final answer	2	**B1** for kx^5 or $6x^k$

271. 0580_w19_ms_21 Q: 10

	Answer	Mark	Partial Marks
	$\frac{16}{x^4}$ or $16x^{-4}$	2	**M1** for $\left(\frac{x}{2}\right)^{-4}$ or $\left(\frac{8}{x^3}\right)^{\frac{4}{3}}$ or $\left(\frac{x^{12}}{4096}\right)^{-\frac{1}{3}}$ or better or **B1** for $\frac{16}{x^k}$ or $16x^k$ or $\frac{k}{x^4}$ or kx^{-4} final answer

272. 0580_w19_ms_21 Q: 11

	Answer	Mark	Partial Marks
	$\frac{P}{2+\pi}$	2	**M1** for $P = r(2+\pi)$

273. 0580_w19_ms_21 Q: 15

	Answer	Mark	Partial Marks
	128	3	**M1** for $y = \frac{k}{x^2}$ **M1** for $y = \frac{their\ k}{\left(\frac{1}{2}\right)^2}$ OR **M2** for $\frac{2\times 4^2}{\left(\frac{1}{2}\right)^2}$ or **M1** for $2\times 4^2 = y\times\left(\frac{1}{2}\right)^2$

274. 0580_w19_ms_21 Q: 18

	Answer	Mark	Partial Marks
	$\frac{x^2-3x-8}{2(x+1)}$ or $\frac{x^2-3x-8}{2x+2}$ final answer	3	**B1** for common denominator $2(x+1)$ or $2x+2$ **M1** for $x(x+1)-2(2x+4)$ or better

275. 0580_w19_ms_21 Q: 24

	Answer	Mark	Partial Marks
(a)	19	2	**M1** for $3(2^x)-5$ soi or for f(8)
(b)	$\frac{x+5}{3}$ oe final answer	2	**M1** for correct first step $y+5=3x$ or $\frac{y}{3}=x-\frac{5}{3}$ or $x=3y-5$

276. 0580_w19_ms_21 Q: 26

	Answer	Mark	Partial Marks
	380	5	**B2** for time = 8, implied by 23 on t-axis or **M1** for $\frac{20}{t}=2.5$ or $\frac{20}{t-15}=2.5$ or $\frac{0-20}{t-15}=-2.5$ oe **M2** for $\frac{1}{2}$(*their* 23 + 15) × 20 or $20\times15+\frac{1}{2}\times$ *their* 8×20 oe or **M1** for any relevant area found

277. 0580_w19_ms_22 Q: 3

	Answer	Mark	Partial Marks
	a^4+3a final answer	1	

278. 0580_w19_ms_22 Q: 9

	Answer	Mark	Partial Marks
	$x<-10$ final answer	2	**M1** for $-12-13>3x-\frac{x}{2}$ oe

279. 0580_w19_ms_22 Q: 15

	Answer	Mark	Partial Marks
(a)	$2.45x+3.15y$ final answer	2	**B1** for one correct term in final answer If 0 scored, **SC1** for $245x+315y$
(b)	13	2	**M1** for $60.55-2.45\times8$ oe

280. 0580_w19_ms_22 Q: 16

	Answer	Mark	Partial Marks
	$y = 5$ ruled $y = x + 1$ ruled Correct region indicated	**4**	**B2** for two correct lines or **B1** for one correct line **B2** for indication of correct region or **B1** for shading that satisfies two of the inequalities

281. 0580_w19_ms_22 Q: 20

	Answer	Mark	Partial Marks
(a)	$(3y + 2x)(6 - a)$ oe final answer	**2**	**M1** for $3y\,(6 - a) + 2x(6 - a)$ oe or $6(2x + 3y) - a(2x + 3y)$ oe
(b)	$3(x + 4y)(x - 4y)$ final answer	**3**	**M2** for $(3x + 12y)(x - 4y)$ or $(3x - 12y)(x + 4y)$ or **M1** for $3(x^2 - 16y^2)$ or for $(x + 4y)(x - 4y)$

282. 0580_w19_ms_22 Q: 21

	Answer	Mark	Partial Marks
(a)	6	**2**	**B1** for 3^4 or 3^{x-2} or **M1** for $3^x = 81 \times 3^2$ or better
(b)	8	**3**	**M2** for $x^{\frac{5}{3}} = 32$ or better or **M1** for $\frac{1}{x^{\frac{1}{3}}} = \frac{32}{x^2}$ or better or $x^{-\frac{1}{3}--2} = 32$ or better

283. 0580_w19_ms_22 Q: 23

	Answer	Mark	Partial Marks
(a)	Tangent ruled at $t = 24$	**B1**	
	-0.7 to -0.3	**B2**	**B2** dep on correct tangent or close attempt at tangent **M1** for rise/run **also dep on** correct tangent drawn or close attempt at tangent. Must see correct or implied calculation from a drawn tangent.
(b)	acceleration or deceleration oe	**1**	
(c)	68	**2**	**M1** for $(22 - 5) \times 4$

284. 0580_w19_ms_23 Q: 6

	Answer	Mark	Partial Marks
	$x^2 + 8x + 15$ final answer	**2**	**M1** for three terms correct from $x^2 + 3x + 5x + 15$

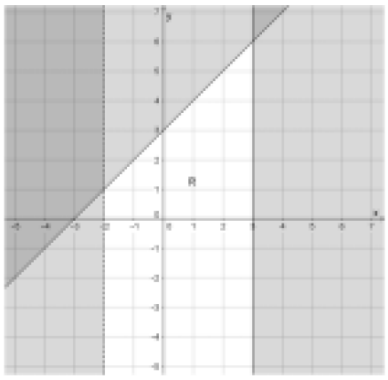
285. 0580_w19_ms_23 Q: 11

	Answer	Mark	Partial Marks
(a)	$3(4x + 5)$ final answer	**1**	
(b)	$(x + 3)(y - 2)$ final answer	**2**	**B1** for $y(x + 3) - 2(x + 3)$ or $x(y - 2) + 3(y - 2)$ or correct answer seen then spoilt

286. 0580_w19_ms_23 Q: 14

	Answer	Mark	Partial Marks
(a)	$\frac{1}{2n}$ oe final answer	**1**	
(b)	5^{n-1} oe final answer	**2**	**M1** for recognition of terms being powers of 5

287. 0580_w19_ms_23 Q: 17

	Answer	Mark	Partial Marks
		4	**B1** for $x = -2$ dashed ruled line and $x = 3$ solid ruled line **B1** for $y = x + 3$ solid ruled line **B2** for indication of correct region or **B1** for shading that satisfies two of the inequalities, e.g. two of $x > -2$, $x \leqslant 3$ and $y \leqslant x + 3$

288. 0580_w19_ms_23 Q: 19

	Answer	Mark	Partial Marks
(a)	0.3 or $\frac{3}{10}$	1	
(b)	760	3	**M2** for correct complete area statement e.g. $70 \times 10 + \frac{1}{2} \times 20 \times 6$ oe or **M1** for one of these area calculations 70×10, $\frac{1}{2} \times 20 \times 6$, 50×10 or $\frac{1}{2} \times (16 + 10) \times 20$

289. 0580_w19_ms_23 Q: 20

	Answer	Mark	Partial Marks
(a)	$\frac{45}{(x+1)^2}$ final answer	2	**M1** for $t = \frac{k}{(x+1)^2}$
(b)	4	2	**M1** for $1.8 \times (x + 1)^2 =$ *their* 45 or better

290. 0580_m18_ms_22 Q: 6

	Answer	Mark	Partial Marks
	$5m\left(3k^2-4m^3\right)$ final answer	2	**B1** for $5\left(3k^2m-4m^4\right)$ or $m\left(15k^2-20m^3\right)$ or for $5m\left(3k^2-4m^3\right)$ with one error in a number

291. 0580_m18_ms_22 Q: 9

	Answer	Mark	Partial Marks
	–12	2	**B1** for 2^3, 2^{-3}, 2^{12} or 2^{-12}

292. 0580_m18_ms_22 Q: 10

	Answer	Mark	Partial Marks
	12	3	**M2** for $9 \times 8 = 6y$ oe OR **M1** for $y = \frac{k}{x}$ oe **M1** for $[y =]$ *their* $\frac{k}{6}$

293. 0580_m18_ms_22 Q: 13

	Answer	Mark	Partial Marks
	correctly eliminating one variable	M1	
	$[x =] 7$ $[y =] -2$	A2	**A1** for each If **M0** scored **SC1** for 2 values satisfying one of the original equations or **SC1** if no working shown, but 2 correct answers given

294. 0580_m18_ms_22 Q: 17

	Answer	Mark	Partial Marks
	$\frac{-7 \pm \sqrt{(7)^2 - 4(2)(-3)}}{2 \times 2}$	B2	**B1** for $\sqrt{(7)^2 - 4(2)(-3)}$ or better **B1** for $p = -7$ and $r = 2 \times 2$ if in form $\frac{p + \sqrt{q}}{r}$ or $\frac{p - \sqrt{q}}{r}$ Completing the square method: **B1** for $(x + 1.75)^2$ oe **B1** for $-1.75 \pm \sqrt{1.5 + 1.75^2}$ oe
	0.39 and – 3.89 final ans cao	B2	**B1** for each If **B0**, **SC1** for 0.4 and – 3.9 or 0.386...and – 3.886... or 0.39 and – 3.89 seen in working or – 0.39 and 3.89

295. 0580_m18_ms_22 Q: 21

	Answer	Mark	Partial Marks
(a)	2	2	**M1** for f(5) or 7– (7 – x) or better
(b)	$30 - 4x$ final answer	2	**M1** for $4(7 - x) + 2$ or better or for correct answer then spoilt
(c)	$15 - 4x^2$ final answer	2	**M1** for $15 - (2x)^2$ or better or for correct answer then spoilt

296. 0580_s18_ms_21 Q: 4

	Answer	Mark	Partial Marks
	66	2	**B1** for 84 or –18 seen

297. 0580_s18_ms_21 Q: 8

	Answer	Mark	Partial Marks
	$7y - 23$ final answer	2	**M1** for $12y - 18$ or $-5y - 5$ or **B1** for answer $7y - k$ or $cy - 23$ $c \neq 0$

298. 0580_s18_ms_21 Q: 12

	Answer	Mark	Partial Marks
	$n < -4.4$ or $n < -4\frac{2}{5}$ final answer	2	**M1** for $8n - 3n < -5 - 17$ or better or $3n - 8n > 17 + 5$ or better

299. 0580_s18_ms_21 Q: 15

	Answer	Mark	Partial Marks
	9	3	**M1** for $y = k(x-1)^2$ **M1** for $[y =]$*their* $k(7-1)^2$ OR **M2** for $\frac{4}{(5-1)^2} = \frac{y}{(7-1)^2}$ oe

300. 0580_s18_ms_21 Q: 17

	Answer	Mark	Partial Marks
(a)	2200	3	**M2** for $\frac{1}{2}(90+130)\times 20$ or $\frac{1}{2}(10\times 20) + (90\times 20) + \frac{1}{2}(30\times 20)$ or **M1** for one area
(b)	16.9 or 16.92…	1	**FT** *their* **(a)** ÷ 130

301. 0580_s18_ms_21 Q: 21

	Answer	Mark	Partial Marks
	$y \geqslant 1.5$ oe $y \geqslant \frac{3}{4}x$ oe $y < -\frac{1}{2}x + 3$ oe	4	**SC3** for $y > 1.5$ oe and $y > \frac{3}{4}x$ oe and $y \leqslant -\frac{1}{2}x + 3$ oe or **B3** for any two correct inequalities or **B1** for $y \geqslant 1.5$ oe and **B2** for $y \geqslant \frac{3}{4}x$ oe **or** $y < -\frac{1}{2}x + 3$ oe or $y = \frac{3}{4}x$ oe **and** $y = -\frac{1}{2}x + 3$ oe or with incorrect inequality signs or **B1** for $y = \frac{3}{4}x$ oe OR $y = -\frac{1}{2}x + 3$ oe or with incorrect inequality signs

302. 0580_s18_ms_21 Q: 22

	Answer	Mark	Partial Marks
(a)	–17	2	**M1** for f(11) seen or $5 - 2(5 - 2x)$ or better
(b)(i)	$4x^2 + 8$ oe	1	
(b)(ii)	$\frac{5-x}{2}$ oe final answer	2	**M1** for $x = 5 - 2y$ or $2x = 5 - y$ or $y - 5 = -2x$ or $\frac{y}{2} = \frac{5}{2} - x$

303. 0580_s18_ms_22 Q: 2

	Answer	Mark	Partial Marks
	$7x - 56$ final answer	1	

304. 0580_s18_ms_22 Q: 3

	Answer	Mark	Partial Marks
	[a =] 15 [b =] –27	**2**	**B1** for each or **SC1** for reversed answers

305. 0580_s18_ms_22 Q: 4

	Answer	Mark	Partial Marks
(a)	[w =] 7	**1**	
(b)	[12x =] 36	**1**	

306. 0580_s18_ms_22 Q: 10

	Answer	Mark	Partial Marks
	$(x + 2)(y + 3)$ final answer	**2**	**B1** for $y(x + 2) + 3(x + 2)$ or $x(y + 3) + 2(y + 3)$

307. 0580_s18_ms_22 Q: 17

	Answer	Mark	Partial Marks
	30	**3**	**M2** for ½ (8 + 2) × v [= 150] oe or **M1** for ½ × 6 × v or 2 × v oe

308. 0580_s18_ms_22 Q: 18

	Answer	Mark	Partial Marks
(a)	$d = 4.9t^2$	**2**	**M1** for $d = kt^2$
(b)	19.6	**1**	**FT** *their* 4.9 × 4

309. 0580_s18_ms_22 Q: 19

	Answer	Mark	Partial Marks
	$y > 2$ oe final answer $y \geqslant 3 - x$ oe final answer	3	**B1** for $y > 2$ oe final answer **B2** for $y \geqslant 3 - x$ oe final answer or **B1** for $y = 3 - x$ oe soi or **SC2** for $y \geqslant 2$ oe **and** $y > 3 - x$ oe final answer

310. 0580_s18_ms_23 Q: 2

	Answer	Mark	Partial Marks
	$w(1 + w^2)$ final answer	1	

311. 0580_s18_ms_23 Q: 9

	Answer	Mark	Partial Marks
	-11	2	**M1** for $1 - p = 3 \times 4$ or better or $-\frac{p}{3} = 4 - \frac{1}{3}$ or better

312. 0580_s18_ms_23 Q: 10

	Answer	Mark	Partial Marks
	$(a + 2b)(2 - x)$ final answer	2	**M1** for $2(a + 2b) - x(a + 2b)$ or $a(2 - x) + 2b(2 - x)$ or $-a(x - 2) - 2b(x - 2)$

313. 0580_s18_ms_23 Q: 11

	Answer	Mark	Partial Marks
	$[\pm]\sqrt{\frac{A}{2\pi + y}}$ final answer	2	**M1** for $\frac{A}{2\pi + y} = x^2$ **M1** for correctly square rooting their expression in x^2 If zero scored **SC1** for $\frac{[\pm]\sqrt{A}}{2\pi + y}$

314. 0580_s18_ms_23 Q: 13

	Answer	Mark	Partial Marks
	$\frac{1}{3-x}$ nfww final answer	2	**B1** for $(3-x)(3+x)$ or $-(x-3)(x+3)$

315. 0580_s18_ms_23 Q: 17

	Answer	Mark	Partial Marks
(a)	27	1	
(b)	$3t^9$ final answer	2	**B1** for kt^9 or for $3t^k$ $(k \neq 0)$

316. 0580_s18_ms_23 Q: 18

	Answer	Mark	Partial Marks
	$6p^2+5p-6$ final answer	3	**B2** for $6p^2+9p-4p-6$ or **B1** for three correct terms

317. 0580_s18_ms_23 Q: 19

	Answer	Mark	Partial Marks
	150	3	**M1** for $y = k(x-1)^2$ **M1** for $[y =]$ *their* $k \times (6-1)^2$ oe OR **M2** for $\frac{y}{24} = \frac{(6-1)^2}{(3-1)^2}$

318. 0580_s18_ms_23 Q: 21

	Answer	Mark	Partial Marks
	$\frac{1}{y(y-1)}$ or $\frac{1}{y^2-y}$ final answer	3	**B1** for common denominator of $y(y-1)$ or y^2-y **B1** for $y-(y-1)$ or $y-y+1$

319. 0580_s18_ms_23 Q: 22

	Answer	Mark	Partial Marks
(a)	$15-4n$ final answer	2	**B1** for $15-kn$ or $p-4n$ $(k \neq 0)$
(b)	$3\times 2^{n-1}$ oe final answer	2	**B1** for recognition of powers of 2 such as 2^k

320. 0580_s18_ms_23 Q: 24

	Answer	Mark	Partial Marks
(a)	25	2	**M1** for $\frac{90\times 1000}{60\times 60}$ oe
(b)	1.25	1	**FT** $\frac{their\,\textbf{(a)}}{20}$ correctly evaluated
(c)	1250	2	**2FT** for *their* **(a)** × 50 correctly evaluated or **M1** for one area e.g. ½(40 + 60) × 25, 25 × 40, ½ × 25 × 20 ½(40 + 60) × 90, 90 × 40, ½ × 90 × 20 ½(40 + 60) × *their* 25, *their* 25 × 40, ½ × *their* 25 × 20

321. 0580_w18_ms_21 Q: 5

	Answer	Mark	Partial Marks
	$6x^2+13x-63$ final answer	2	**M1** for 3 correct terms of $6x^2-14x+27x-63$

322. 0580_w18_ms_21 Q: 7

	Answer	Mark	Partial Marks
	$\frac{4}{x^3}$ oe final answer	2	**M1** for $y=\frac{k}{x^3}$ oe

323. 0580_w18_ms_21 Q: 11

	Answer	Mark	Partial Marks
(a)	23	1	
(b)	$3n+5$ oe	2	**B1** for $3n+j$ or $kn+5$, $k\neq 0$

324. 0580_w18_ms_21 Q: 12

	Answer	Mark	Partial Marks
	4, 5, 6	**3**	**B2** for 1 error or 1 omission or **M2** for $3.75 \leqslant n < 7$ oe or **M1** for $3.75 \leqslant n$ or $n < 7$ or better

325. 0580_w18_ms_21 Q: 15

	Answer	Mark	Partial Marks
	$\frac{x^2-3x+8}{3(x+2)}$ or $\frac{x^2-3x+8}{3x+6}$ final answer	**3**	**B1** for common denominator $3(x + 2)$ **M1** for $(x-5)(x+2)+3\times 6$

326. 0580_w18_ms_21 Q: 17

	Answer	Mark	Partial Marks
(a)	8	**1**	
(b)(i)	$\frac{x^2}{16}$ final answer	**1**	
(b)(ii)	$a^{-3}b^5$ or $\frac{b^5}{a^3}$ final answer	**2**	**B1** for $a^{-3}b^k$ or a^kb^5

327. 0580_w18_ms_21 Q: 18

	Answer	Mark	Partial Marks
	for correctly equating one set of coefficients	**M1**	
	for correct method to eliminate one variable	**M1**	
	[x =] 6 [y =] –8	**A2**	**A1** for each If **M0** scored, **SC1** for 2 values satisfying one of the original equations **or** if no working shown, but 2 correct answers given

328. 0580_w18_ms_21 Q: 19

	Answer	Mark	Partial Marks
	$\frac{-7 \pm \sqrt{(7)^2 - 4(3)(-11)}}{2 \times 3}$	B2	**B1** for $\sqrt{(7)^2 - 4(3(-11))}$ or better and **B1** for $\frac{-7+\sqrt{q}}{2(3)}$ or $\frac{-7-\sqrt{q}}{2(3)}$
	–3.41 and 1.08 cao	B2	**B1** for each If **B0**, **SC1** for –3.4 and 1.1 or –3.409 and 1.076 or –3.4089... and 1.0756.... or 3.41 and –1.08 or –3.41 and 1.08 seen in working

329. 0580_w18_ms_21 Q: 23

	Answer	Mark	Partial Marks
(a)	27	2	**M1** for 3^{3x} seen
(b)	3	2	**M1** for $7 + 3x = 2^4$
(c)	$\frac{x-7}{3}$ oe final answer	2	**M1** for $x = 7 + 3y$ or $y - 7 = 3x$ or $-3x = 7 - y$ or $\frac{y}{3} = \frac{7}{3} + x$

330. 0580_w18_ms_22 Q: 4

	Answer	Mark	Partial Marks
	$6x - 2x^3$ final answer	2	**B1** for $6x$ or $-2x^3$

331. 0580_w18_ms_22 Q: 6

	Answer	Mark	Partial Marks
	$m \geqslant 3$ final answer	2	**M1** for correct first step e.g. $7m \geqslant 19 + 2$

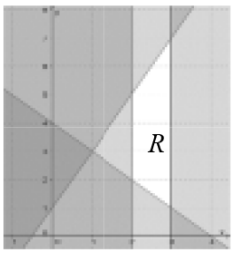
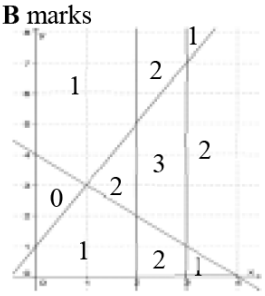
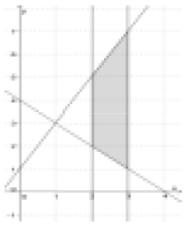
332. 0580_w18_ms_22 Q: 8

	Answer	Mark	Partial Marks
	$(x + 5)(y + 2)$ final answer	2	**B1** for $y(x + 5) + 2(x + 5)$ or $x(y + 2) + 5(y + 2)$

333. 0580_w18_ms_22 Q: 13

	Answer	Mark	Partial Marks
	$6n - 10$ oe	2	**B1** for $6n + c$ or $kn - 10$ $(k \neq 0)$

334. 0580_w18_ms_22 Q: 14

	Answer	Mark	Partial Marks
	Correct region identified 	3	**B** marks  or **SC1** for 

335. 0580_w18_ms_22 Q: 16

	Answer	Mark	Partial Marks
	$(a =)$ 36 $(b =) -6$	3	**B2** for $a = 36$ or **M1** for $b = -6$ or $x^2 + bx + bx + b^2$ or better or $b^2 = a$

336. 0580_w18_ms_22 Q: 20

	Answer	Mark	Partial Marks
	$\frac{2x}{3+x}$ oe final answer	4	**M1** for correctly clearing the denominator and expanding bracket **M1** for correctly collecting terms in m on one side and terms not in m on the other **M1** for correct factorising **M1** for correct division dependent on m appearing only once in a factorised expression

337. 0580_w18_ms_22 Q: 25

	Answer	Mark	Partial Marks
(a)(i)	$5x^3 + 2$ final answer	1	
(a)(ii)	$\frac{x-2}{5}$ final answer	2	**M1** for correct first step e.g. $y - 2 = 5x$, $x = 5y + 2$, $\frac{y}{5} = x + \frac{2}{5}$
(b)	5	2	**M1** for $a \times (-2)^2 + 1 = 21$

338. 0580_w18_ms_23 Q: 2

	Answer	Mark	Partial Marks
	$y(1-2y)$ final answer	1	

339. 0580_w18_ms_23 Q: 7

	Answer	Mark	Partial Marks
	$-3p - 4q$ final answer	2	**B1** for $-3p$ or $-4q$

340. 0580_w18_ms_23 Q: 10

	Answer	Mark	Partial Marks
	13	2	**M1** for $3w = 32 + 7$ or $w - \frac{7}{3} = \frac{32}{3}$ or better

341. 0580_w18_ms_23 Q: 11

	Answer	Mark	Partial Marks
	$\frac{A - \pi r^2}{\pi r}$ or $\frac{A}{\pi r} - r$ oe final answer	2	**M1** for $A - \pi r^2 = \pi rl$ or $\pi r^2 - A = -\pi rl$ or $\frac{A}{\pi r} = l + r$

342. 0580_w18_ms_23 Q: 16

	Answer	Mark	Partial Marks
(a)	$\frac{1}{w}$ or w^{-1}	**1**	
(b)	$27w^9$ final answer	**2**	**B1** for kw^9 or $27w^k$

343. 0580_w18_ms_23 Q: 17

	Answer	Mark	Partial Marks
	10	**3**	**M1** for $y = k\sqrt{x}$ **M1** for $y = \textit{their } k \times \sqrt{25}$ OR **M2** for $\frac{y}{6} = \sqrt{\frac{25}{9}}$

344. 0580_w18_ms_23 Q: 18

	Answer	Mark	Partial Marks
	$\frac{1}{x(x+1)}$ oe final answer nfww	**3**	**B1** for common denominator $x(x+1)$ oe **M1** for $x + 1 - x$

345. 0580_w18_ms_23 Q: 20

	Answer	Mark	Partial Marks
	$\frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-2)}}{2(3)}$ oe	**B2**	**B1** for $\sqrt{(-2)^2 - 4(3)(-2)}$ or better or **B1** for $\frac{-(-2)+\sqrt{q}}{2(3)}$ or $\frac{-(-2)-\sqrt{q}}{2(3)}$
	–0.55, 1.22	**B2**	**B1** for each If zero scored, **SC1** for – 0.6 and 1.2 or –0.549 or –0.548… and 1.215… or 0.55 and −1.22 or –0.55 and 1.22 seen in working

346. 0580_w18_ms_23 Q: 21

	Answer	Mark	Partial Marks
(a)	1.2	**1**	
(b)	45	**3**	**M2** for $\frac{1}{2}\times10\times12+12(T-10)[=480]$ oe or **M1** for one relevant area OR **M1** for $480-\frac{1}{2}\times10\times12$ implied by 420 **M1** for $\frac{420}{12}[+10]$

347. 0580_w18_ms_23 Q: 22

	Answer	Mark	Partial Marks
	$\frac{x-1}{x}$ or $1-\frac{1}{x}$ nfww final answer	**4**	**B1** for $x(2x+1)$ **B2** for $(2x+1)(x-1)$ or **B1** for $2x(x-1)+[1](x-1)$ or $x(2x+1)-[1](2x+1)$ or $(2x+a)(x+b)$ where $ab=-1$ or $a+2b=-1$

348. 0580_w18_ms_23 Q: 25

	Answer	Mark	Partial Marks
(a)	$(x+y)(p-1)$ final answer	**2**	**M1** for $p(x+y)-(x+y)$ or $x(p-1)+y(p-1)$
(b)	$2(t+7m)(t-7m)$ final answer	**3**	**M2** for $(2t+14m)(t-7m)$ or $(t+7m)(2t-14m)$ or correct answer seen or **M1** for $2(t^2-49m^2)$ or $(t+7m)(t-7m)$ or $2(t+7)(t-7)$

349. 0580_m17_ms_22 Q: 1

	Answer	Mark	Partial Marks
	$18w+14$ final answer	**2**	**M1** for $20w+12$ or $-2w+2$ or answer $18w+k$ or $kw+14$

350. 0580_m17_ms_22 Q: 5

	Answer	Mark	Partial Marks
	150	2	**M1** for $2\times3+16\times3^2$

351. 0580_m17_ms_22 Q: 12

	Answer	Mark	Partial Marks
	4	3	**M1** for $y=\frac{k}{x^2}$ **M1** for $y=\frac{their\ k}{10^2}$ or **M2** for $5^2\times16=10^2\times y$ oe

352. 0580_m17_ms_22 Q: 13

	Answer	Mark	Partial Marks
(a)	$5c(3c-1)$ final answer	2	**B1** for $5\left(3c^2-c\right)$ or $c\left(15c-5\right)$
(b)	$\left(2p-m\right)\left(k+3\right)$ final answer	2	**B1** for $k\left(2p-m\right)+3\left(2p-m\right)$ or $2p\left(k+3\right)-m\left(k+3\right)$

353. 0580_m17_ms_22 Q: 15

	Answer	Mark	Partial Marks
(a)	t^{20} final answer	1	
(b)	x^{10} final answer	1	
(c)	$27m^6$ final answer	2	**B1** for $27m^k$ or km^6 as final answer

354. 0580_m17_ms_22 Q: 16

	Answer	Mark	Partial Marks
(a)	0.25 or $\frac{1}{4}$	**1**	
(b)	0.45	**3**	**B2** for 450 or **M2** for $\frac{1}{2} \times 60 \times 15 \div 1000$ or **M1** for $\frac{1}{2} \times 60 \times 15$ If 0 scored **SC1** for correct conversion of their distance in metres to kilometres

355. 0580_m17_ms_22 Q: 21

	Answer	Mark	Partial Marks
(a)	10	**2**	**M1** for $\frac{x}{4} - 3 = -0.5$
(b)	$\frac{x+7}{6}$ final answer	**2**	**M1** for $y + 7 = 6x$ or $\frac{y}{6} = x - \frac{7}{6}$ or $x = 6y - 7$
(c)	–2	**2**	**M1** for [f(13) =] $\frac{1}{4}$

356. 0580_s17_ms_21 Q: 1

	Answer	Mark	Partial Marks
	x^{10}	**1**	

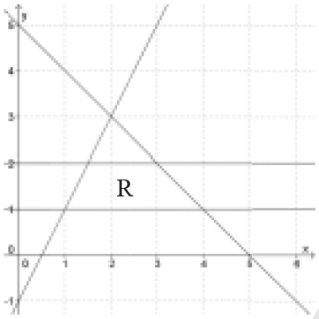
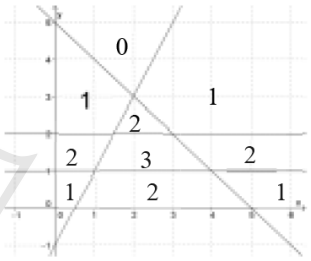
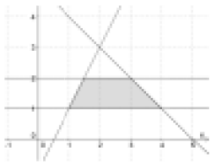
357. 0580_s17_ms_21 Q: 5

	Answer	Mark	Partial Marks
	$4n(3n - m)$ final answer	**2**	**B1** for $4(3n^2 - mn)$ or $n(12n - 4m)$ or $2n(6n - 2m)$ or $2(6n^2 - 2mn)$

358. 0580_s17_ms_21 Q: 9

	Answer	Mark	Partial Marks
	7.65	3	**M1** for $h = k\sqrt{p}$ oe **M1** for $h =$ *their* $k\sqrt{p}$ or **M2** for $\frac{5.4}{\sqrt{1.44}} = \frac{h}{\sqrt{2.89}}$ oe

359. 0580_s17_ms_21 Q: 10

	Answer	Mark	Partial Marks
	Correct region identified 	3	 **SC1** for 

360. 0580_s17_ms_21 Q: 15

	Answer	Mark	Partial Marks
(a)	0.8 or $\frac{4}{5}$	1	
(b)	1180	3	**M2** for (0.5 × 16 × 20) + (0.5 × 4 × 30) + (80 × 12) oe or **M1** for part area

361. 0580_s17_ms_21 Q: 22

	Answer	Mark	Partial Marks
(a)	$\frac{x}{x+3}$ final answer	3	**B1** for $x(x-3)$ **B1** for $(x-3)(x+3)$
(b)	$\frac{8x+7}{(x-4)(2x+5)}$ final answer	3	**B1** for common denominator of $(x-4)(2x+5)$ oe **M1** for $3(2x+5)+2(x-4)$ oe with an attempt to expand the brackets

362. 0580_s17_ms_22 Q: 6

	Answer	Mark	Partial Marks
	$7(2x-3y)$ final answer	1	

363. 0580_s17_ms_22 Q: 7

	Answer	Mark	Partial Marks
	41	2	**M1** for $5(7)-3(-2)$

364. 0580_s17_ms_22 Q: 10

	Answer	Mark	Partial Marks
	$\frac{1}{6}$ oe	2	**M1** for $2-1=5x+x$ oe

365. 0580_s17_ms_22 Q: 13

	Answer	Mark	Partial Marks
	$n < 3.5$ oe final answer	2	**M1** for $18-11>5n-3n$ oe

366. 0580_s17_ms_22 Q: 15

	Answer	Mark	Partial Marks
	$[\pm]\sqrt{\frac{p}{2}}$ oe	2	**M1** for $\frac{p}{2}=q^2$ or $\sqrt{p}=\sqrt{2}\,q$ or $[q=]\sqrt{their\ \frac{p}{2}}$ or $[q=]\frac{\sqrt{p}}{their\sqrt{2}}$

367. 0580_s17_ms_22 Q: 20

	Answer	Mark	Partial Marks
	$\frac{2x^2+x-7}{3(x+1)}$ or $\frac{2x^2+x-7}{3x+3}$ final answer	3	**M1** for $(2x-1)(x+1)-2\times 3$ oe with an attempt to expand the brackets **B1** for $3(x+1)$ or $3x+3$ for denominator

368. 0580_s17_ms_22 Q: 21

	Answer	Mark	Partial Marks
	1.5 or $\frac{3}{2}$ or $1\frac{1}{2}$	3	**M1** for $\frac{k}{\sqrt{1+x}}$ **M1** for $y=\frac{\text{their } k}{\sqrt{1+15}}$ or **M2** for $\frac{2}{\sqrt{1+15}}=\frac{y}{\sqrt{1+8}}$

369. 0580_s17_ms_22 Q: 22

	Answer	Mark	Partial Marks
(a)	$(3t+u)(3t-u)$ final answer	2	**B1** for $(at+bu)(ct+du)$ final answer where $ac=9$ or $ad+bc=0$ or $bd=-1$
(b)	$(c-2d)(2-p)$ or $(p-2)(2d-c)$ final answer	2	**M1** for $2(c-2d)-p(c-2d)$ or $c(2-p)-2d(2-p)$ or $p(2d-c)-2(2d-c)$ or $2d(p-2)-c(p-2)$

370. 0580_s17_ms_22 Q: 25

	Answer	Mark	Partial Marks
(a)	$8x^{12}$ final answer	2	**B1** for $8x^k$ or kx^{12} in final answer $k\neq 0$
(b)	9	2	**M1** for $27^{\frac{2}{3}}$ or 3^k or $p^{\frac{1}{2}}=3$ or $p^3=729$

371. 0580_s17_ms_23 Q: 2

	Answer	Mark	Partial Marks
	$4x(x-2y)$ final answer	2	**M1** for $4\left(x^2-2xy\right)$ or $x\left(4x-8y\right)$ or $2\left(2x^2-4xy\right)$ or $2x\,(2x-4y)$

372. 0580_s17_ms_23 Q: 4

	Answer	Mark	Partial Marks
	$(x-y)^2$ oe final answer	2	**M1** for $x-y=\sqrt{a}$ or *their* $(x-y)$ squared

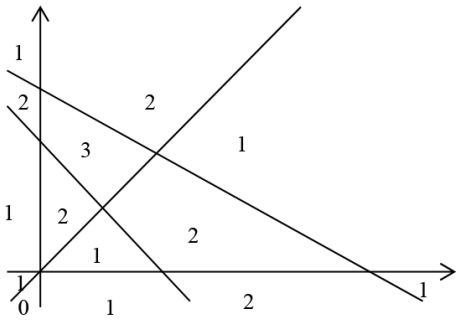
373. 0580_s17_ms_23 Q: 7

	Answer	Mark	Partial Marks
	$\frac{32}{x^2}$ or $32x^{-2}$ final answer	2	**M1** for $y=\frac{k}{x^2}$ oe or $[k=]\ 32$

374. 0580_s17_ms_23 Q: 8

	Answer	Mark	Partial Marks
	$\frac{2}{a^4}$ or $2a^{-4}$ final answer	2	**B1** for $\frac{2}{a^k}$ oe or $\frac{k}{a^4}$ oe $(k\neq 0)$ final answer

375. 0580_s17_ms_23 Q: 11

	Answer	Mark	Partial Marks
	Correct region	3	 **SC1** for *R* not marked and reverse shading

376. 0580_s17_ms_23 Q: 12

	Answer	Mark	Partial Marks
(a)	$3+12x$ final answer	**1**	
(b)	$24x+31$ final answer	**2**	**M1** for $3+4(6x+7)$

377. 0580_s17_ms_23 Q: 16

	Answer	Mark	Partial Marks
(a)	$x \leqslant 3$ final answer	**2**	**M1** for $13-7 \geqslant 3x-x$ oe
(b)	1, 2, 3	**1FT**	correct answer or **FT** their answer to **(a)**

378. 0580_s17_ms_23 Q: 18

	Answer	Mark	Partial Marks
	3000	**3**	**M2** for $12.5\times\frac{1}{2}(200+280)$ oe or **M1** for part area

379. 0580_s17_ms_23 Q: 20

	Answer	Mark	Partial Marks
(a)	6	**1**	
(b)	$2x^3$ final answer	**1**	
(c)	$15y^4$ final answer	**2**	**B1** for $15y^k$ or ky^4 as final answer ($k \neq 0$)

380. 0580_s17_ms_23 Q: 21

	Answer	Mark	Partial Marks
	$\sqrt{10^2-4\times5\times2}$ oe or better	**B1**	If completing the square: **B1** for $(x+1)^2$ oe **B1** for $-1+\sqrt{1-\frac{2}{5}}$ or $-1-\sqrt{1-\frac{2}{5}}$ oe
	$\frac{-10+\sqrt{q}}{2(5)}$ or $\frac{-10-\sqrt{q}}{2(5)}$ oe	**B1**	
	– 0.23, –1.77 final ans cao	**B1B1**	**SC1** for – 0.2 or – 0.225... **and** –1.8 or –1.774... or –1.775 or 0.23 and 1.77 as answer or – 0.23 and –1.77 seen in working Maximum score without working is 2

381. 0580_s17_ms_23 Q: 23

	Answer	Mark	Partial Marks
(a)	$4(x-6)$ or $4x-24$ as final answer	**1**	
(b)	$x^2+23x+26$ final answer	**3**	**B2** for $x^2+4x+4x+16$ or better or **B1** for $15x+10$

382. 0580_w17_ms_21 Q: 5

	Answer	Mark	Partial Marks
	$3x(4x+5y-3)$ final answer	**2**	**B1** for $3(4x^2+5xy-3x)$ or $x(12x+15y-9)$ allow in working or correct answer spoiled If zero scored, **SC1** for $3x(4x+5y-3)$ with only 2 correct elements in the brackets, allow in working

383. 0580_w17_ms_21 Q: 7

	Answer	Mark	Partial Marks
	Diagonal line from (0, 0) to (30, 12)	**1**	
	and Horizontal line from (30, 12) to (70, 12)	**1FT**	**FT** for horizontal line from (30, *k*) to (70, *k*) where *k* is *their* 12

384. 0580_w17_ms_21 Q: 13

	Answer	Mark	Partial Marks
(a)	m^{10} final answer	**1**	
(b)	$20x^5y^2$ final answer	**2**	**B1** for 2 out of 3 elements correct in final answer or correct answer spoiled

385. 0580_w17_ms_21 Q: 17

	Answer	Mark	Partial Marks
(a)	$(y =) \frac{72}{(x+1)^2}$ oe	**2**	**M1** for $y = \frac{k}{(x+1)^2}$
(b)	32	**1FT**	**FT** correct evaluation from *their* equation in **(a)** using 0.5

386. 0580_w17_ms_21 Q: 19

	Answer	Mark	Partial Marks
	$\frac{x^2+20x+31}{2(x-3)(x+7)}$ final answer	**4**	**B1** for a common denominator of [2](x – 3)(x + 7) seen isw **M1** for $2\times5\times(x+7) + 2\times3\times(x-3) + (x-3)(x+7)$ oe **and** must have attempted to expand all the brackets in the numerator **M1** for $10x + 70 + 6x - 18$ **or** $x^2 - 3x + 7x - 21$ **or** [2](5x + 35 + 3x – 9) or better

387. 0580_w17_ms_21 Q: 23

	Answer	Mark	Partial Marks
(a)	$x + y \leqslant 16$ oe $x \geqslant 4$ oe	2	**B1** for each mark final answers If zero scored, **SC1** for $x + y < 16$ **and** $x > 4$
(b)	Correct shading	3	**M2** for lines at $x = 4$ **and** $x + y = 16$ or for correct shading of $x < 4$ or $x + y > 16$ or **M1** for line at $x = 4$ or *their* $x = 4$ or for line at $x + y = 16$ or *their* $x + y = 16$
(c)	144	2	**M1** for (8, 8) selected or for $10 \times x + 8 \times y$ for any numerical point which is inside or on the boundary of *their* unshaded region

388. 0580_w17_ms_22 Q: 12

	Answer	Mark	Partial Marks
	$15 + 2n - n^2$ final answer	2	**M1** for three terms of $15 + 5n - 3n - n^2$ correct

389. 0580_w17_ms_22 Q: 14

	Answer	Mark	Partial Marks
	–1, 0, 1, 2, 3	3	**B2** for $-2 < n \leqslant 3$ or list with one error or omission or **M1** for $-5 + 1 < 2n$ or $2n \leqslant 5 + 1$ or a list with 3 correct and no more than 1 incorrect or if zero scored, **SC1** for 5, 3, 1, –1, –3

390. 0580_w17_ms_22 Q: 15

	Answer	Mark	Partial Marks
	$\frac{y+x}{xy}$ final answer	3	**B1** for $y(x+1) - x(y-1)$ **B1** for common denominator xy or **SC2** for $\frac{y-x}{xy}$ final answer

391. 0580_w17_ms_22 Q: 16

	Answer	Mark	Partial Marks
(a)	-1	**1**	
(b)	$-6n + 29$ oe	**2**	**M1** for $-6n + k$ (any k) or $-kn + 29$ $(k \neq 0)$

392. 0580_w17_ms_22 Q: 18

	Answer	Mark	Partial Marks
	Correctly eliminating one variable	**M1**	
	$[x =] \frac{2}{3}$ or 0.667 or 0.6666…	**A1**	
	$[y =] \frac{1}{3}$ or 0.333 or 0.333…	**A1**	If zero scored, **SC1** for 2 values satisfying one of the original equations or if no working shown but 2 correct answers given

393. 0580_w17_ms_22 Q: 19

	Answer	Mark	Partial Marks
	$[\pm] \sqrt{y^2 - 1}$ final answer	**3**	**M1** for correct squaring **M1** for correct rearranging for x or x^2 term **M1** for correct square root

394. 0580_w17_ms_22 Q: 20

	Answer	Mark	Partial Marks
	132	**3**	**M2** for $\frac{1}{2}(7 + 15) \times 12$ or **M1** for any correct area

395. 0580_w17_ms_22 Q: 24

	Answer	Mark	Partial Marks
(a)	$\frac{5}{14}$ or 0.357 or 0.357…	**2**	**M1** for $7 - 2 = 11n + 3n$ oe or better
(b)	18	**2**	**M1** for $p - 3 = 3 \times 5$ or $\frac{p}{5} = 3 + \frac{3}{5}$

396. 0580_w17_ms_22 Q: 25

	Answer	Mark	Partial Marks
(a)	$(x-12)(x+11)$ final answer	2	**B1** for $(x+a)(x+b)$ where $ab=-132$ or $a+b=-1$
(b)	$x(x+2)(x-2)$ final answer	2	**B1** for $x(x^2-4)$ or $(x+2)(x^2-2x)$ or $(x-2)(x^2+2x)$

397. 0580_w17_ms_22 Q: 27

	Answer	Mark	Partial Marks
(a)	27	1	
(b)	x^2 final answer	1	
(c)	$\frac{y^2}{2}$ or $0.5y^2$ final answer	2	**M1** for $\left(\frac{y^6}{8}\right)^{\frac{1}{3}}$ or $\left(\frac{2}{y^2}\right)^{-1}$ or better or **SC1** for answer $\frac{y^2}{c}$ or $\frac{y^k}{2}$ or $\frac{2}{y^2}$

398. 0580_w17_ms_23 Q: 5

	Answer	Mark	Partial Marks
	$9(2x+3y)$ final answer	1	

399. 0580_w17_ms_23 Q: 6

	Answer	Mark	Partial Marks
	$\frac{2}{3}$ oe	1	

400. 0580_w17_ms_23 Q: 9

	Answer	Mark	Partial Marks
	$x \leqslant -1.2$ oe final answer	2	**B1** for -1.2 oe or **M1** for correct step to collect x's and numbers

401. 0580_w17_ms_23 Q: 14

	Answer	Mark	Partial Marks
	$(3x + 5)(x - 4)$ [=0]	**M2**	**M1** for $(3x + b)(x + a)$ where $ab = -20$ or $3a + b = -7$
	4 and $-\frac{5}{3}$ oe	**A1**	If zero scored, **SC1** for 2 correct answers from no working or other methods

402. 0580_w17_ms_23 Q: 15

	Answer	Mark	Partial Marks
	$25x^2 - 8$ final answer	**3**	**M1** for $(5x - 3)^2 + 6(5x - 3) + 1$ **M1** for $25x^2 - 15x - 15x + 9$ soi or better

403. 0580_w17_ms_23 Q: 16

	Answer	Mark	Partial Marks
	$\frac{12m}{p - 4y}$ or $\frac{-12m}{4y - p}$ final answer	**4**	**M1** for $12m + 4xy = xp$ or $3m = \frac{xp}{4} - xy$ **M1** for $12m = xp - 4xy$ or $3m = x(\frac{p}{4} - y)$ **M1** for $12m = x(p - 4y)$ or $\frac{3m}{\frac{p}{4} - y} = x$ **M1** for $\frac{12m}{p - 4y}$ To a maximum of 3 marks for an incorrect answer

404. 0580_w17_ms_23 Q: 17

	Answer	Mark	Partial Marks
(a)	1, –4 and –9	**1**	
(b)	Yes because 13 is an integer oe	**3**	**B2** for $[n =] 13$ or **M2** for $\sqrt{((848 - 3) \div 5)}$ or $5 \times 13^2 + 3$ [= 848] or **M1** for $5n^2 + 3 = 848$ oe

405. 0580_m16_ms_22 Q: 1

	Answer	Mark	Partial Marks
	7, – 4	**1**	

406. 0580_m16_ms_22 Q: 2

	Answer	Mark	Partial Marks
	$2x(1-2y)$ final answer	**2**	**M1** for $2(x-2xy)$ or $x(2-4y)$ or for correct answer then spoilt

407. 0580_m16_ms_22 Q: 4

	Answer	Mark	Partial Marks
	$n < 1.5$ oe final answer	**2**	**B1** for 1.5 oe in answer or **M1** for $3 > 8n - 6n$ oe

408. 0580_m16_ms_22 Q: 14

	Answer	Mark	Partial Marks
(a)	x^8y^7 final answer	**2**	**B1** for answer x^8y^k or x^ky^7 $(k \neq 0)$
(b)	$27p^6m^{15}$ final answer	**2**	**B1** for 2 correct of 27, p^6, m^{15} in a product as answer

409. 0580_m16_ms_22 Q: 17

	Answer	Mark	Partial Marks
	$\frac{-(-11)\pm\sqrt{(-11)^2-4(3)(4)}}{2\times3}$	**2**	**B1** for $\sqrt{(-11)^2-4(3)(4)}$ or better and, if in form $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$, **B1** for $p=-(-11)$ and $r=2(3)$
	0.41 and 3.26 final ans cao	**B1B1**	**SC1** for 0.4 and 3.3 or 0.409... and 3.257... or -0.41 and -3.26 or 0.41 and 3.26 seen in working

410. 0580_m16_ms_22 Q: 19

	Answer	Mark	Partial Marks
	$y < 2$ oe and $x \geqslant -2$ oe	2	**B1** for either correct
	$y \geqslant \frac{1}{2}x + 1$ oe and $y \leqslant -x + 3$ oe	3	**B2** for either $y \geqslant \frac{1}{2}x + 1$ oe or $y \leqslant -x + 3$ oe or **SC2** for $y = \frac{1}{2}x + 1$ oe **and** $y = -x + 3$ oe or **SC1** for $y = \frac{1}{2}x + 1$ oe **or** $y = -x + 3$ oe or **SC4** for $y \leqslant 2$ oe , $x > -2$ oe, $y > \frac{1}{2}x + 1$ oe and $y < -x + 3$ oe

411. 0580_m16_ms_22 Q: 20

	Answer	Mark	Partial Marks
(a)	$9a + 3b$	1	
(b)	$36a + 6b = 96$ or $9a + 3b = 21$	B1	
	for correct method to eliminate one variable	M1	
	$a = 3$ $b = -2$	A1 A1	If **M0 A0 A0** scored **SC1** for 2 values satisfying $36a+6b=96$ or $9a+3b=21$ or if no working shown, but 2 correct answers given

412. 0580_s16_ms_21 Q: 7

	Answer	Mark	Partial Marks
	11	2	**M1** for $-2 \times -7 - 3$ soi

413. 0580_s16_ms_21 Q: 8

	Answer	Mark	Partial Marks
	$\frac{py}{q}$ final answer	2	**M1** for one correct step

414. 0580_s16_ms_21 Q: 12

	Answer	Mark	Partial Marks
	$2p^4$ final answer	2	**B1** for kp^4 or $2p^k$ as answer

415. 0580_s16_ms_21 Q: 13

	Answer	Mark	Partial Marks
	$n > 3.75$	2	**M1** for $7 + 8 < 5n - n$ oe

416. 0580_s16_ms_21 Q: 15

	Answer	Mark	Partial Marks
(a)	-3	1	
(b)	$9 - 2n$ oe	2	**B1** for $-2n + k$ or $dn + 9$ where $d \neq 0$

417. 0580_s16_ms_21 Q: 21

	Answer	Mark	Partial Marks
	2	3	**M1** for $y = k\sqrt{x}$ **A1** for $k = 4$ or **M2** for $\frac{\sqrt{9}}{12} = \frac{\sqrt{1/4}}{y}$ oe

418. 0580_s16_ms_21 Q: 24

	Answer	Mark	Partial Marks
(a)	$(a+2)(2+p)$ final answer	2	**B1** for $2(a+2) + p(a+2)$ or $a(2+p) + 2(2+p)$
(b)	$2(9+2t)(9-2t)$ oe	2	**B1** for $2(81-4t^2)$ oe or $(18+4t)(9-2t)$ oe If 0 scored **SC1** for $(9 + 2t)(9 - 2t)$ final answer

419. 0580_s16_ms_22 Q: 6

	Answer	Mark	Partial Marks
	$\frac{1}{8}x^2$ or $0.125x^2$ final answer	2	**B1** for answer $\frac{1}{8}x^k$ or nx^2

420. 0580_s16_ms_22 Q: 8

	Answer	Mark	Partial Marks
	$x > -9$	2	**M1** for $\frac{x}{3} > 2 - 5$ oe or $\left(\frac{x}{3} + 5\right) \times 3 > 2 \times 3$ oe

421. 0580_s16_ms_22 Q: 10

	Answer	Mark	Partial Marks
	$p = \frac{8r - 5}{r - 3}$ oe final answer	3	**M1** for correctly collecting terms in p on one side and terms not in p on the other side **M1** for correct factorising **M1** for correct division dependent on p appearing only once in a factorised expression Maximum M2 for an incorrect final answer

422. 0580_s16_ms_22 Q: 15

	Answer	Mark	Partial Marks
	$a = 3.5$ or $\frac{7}{2}$ **and** $b = -17.25$ or $-\frac{69}{4}$	3	**B2** for one correct or **M2** for $(x + \frac{7}{2})^2 - 5 - \left(\frac{7}{2}\right)^2$ or **M1** for $(x + \frac{7}{2})^2$ oe or $2a = 7$ or $a^2 + b = -5$ after $x^2 + 2ax + a^2$

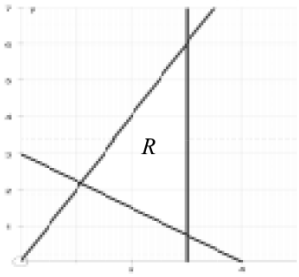
423. 0580_s16_ms_22 Q: 16

	Answer	Mark	Partial Marks
	Correctly eliminating one variable $x = 4$ $y = 0.5$ oe	M1 A1 A1	If zero scored **SC1** for 2 values satisfying one of the original equations or if no working shown, but 2 correct answers given

424. 0580_s16_ms_22 Q: 18

	Answer	Mark	Partial Marks
(a)	$3n + 13$ oe final answer	2	**M1** for $3n + c$ or $kn + 13$
(b)	3^{n-1} oe final answer	2	**M1** for recognition of terms being powers of 3

425. 0580_s16_ms_22 Q: 23

	Answer	Mark	Partial Marks
	Correct shading with three ruled accurate solid boundary lines 	5	**B2** for $3x + 4y = 12$ line through (0, 3) and (4, 0) or **B1** for a diagonal line through one of these points **B1** for $y = 2x$ line through (0, 0) and (1, 2) or through (1, 2) and (3, 6) **B1** for $x = 3$ line

426. 0580_s16_ms_23 Q: 4

	Answer	Mark	Partial Marks
	0.5 or $\frac{1}{2}$	2	**M1** for correct first step e.g. $6y + 6 = 9$ or $y + 1 = \frac{9}{6}$

427. 0580_s16_ms_23 Q: 7

	Answer	Mark	Partial Marks
	$8x^6$ final answer	2	**B1** for $8x^k$ or cx^6

428. 0580_s16_ms_23 Q: 16

	Answer	Mark	Partial Marks
	90	3	**M1** for $y = k(x + 2)^2$ **A1** for $k = 2.5$ or **M2** for $\frac{(8+2)^2}{250} = \frac{(4+2)^2}{y}$ oe

429. 0580_s16_ms_23 Q: 20

	Answer	Mark	Partial Marks
	$y < 4$ $y \geqslant 3$ $x \geqslant 2$ $y > x$	4	**B1** for each correct answer to a maximum of 3 marks. First two may be combined as a single inequality e.g. $3 \leqslant y < 4$ for **B2** After 0 scored **SC1** for use of = signs or incorrect inequality signs in all four equations

430. 0580_w16_ms_21 Q: 7

	Answer	Mark	Partial Marks
	$\frac{x^2+2y^2}{xy}$ or $\frac{x}{y}+\frac{2y}{x}$ final answer	2	**B1** for $xy(x^2+2y^2)$ or **M1** for $\frac{x^2y+2y^3}{xy^2}$ or $\frac{x^3+2xy^2}{x^2y}$

431. 0580_w16_ms_21 Q: 10

	Answer	Mark	Partial Marks
	$6x^8$ final answer	2	**B1** for $6x^k$, $6\times x^8$ or kx^8 $(k \neq 0)$ as final answer

432. 0580_w16_ms_21 Q: 11

	Answer	Mark	Partial Marks
	Correctly eliminating one variable	M1	
	[x =] −1 and	A1	If zero scored, **SC1** for 2 values that satisfy one of the original equations **or** **SC1** if no working shown, but 2 correct answers given
	[y =] 5	A1	

433. 0580_w16_ms_21 Q: 13

	Answer	Mark	Partial Marks
(a)	$(2p-3)(2p+3)$ final answer	**1**	
(b)	$(a-2b)(2x-y)$ oe final answer	**2**	**B1** for $2x(a-2b)-y(a-2b)$ or $a(2x-y)-2b(2x-y)$

434. 0580_w16_ms_21 Q: 14

	Answer	Mark	Partial Marks
	$6\frac{2}{3}$ oe	**3**	**M1** for $y = k\sqrt{x+2}$ oe or better e.g. $2 = k\sqrt{7+2}$ **M1** for [y =] their $k \times \sqrt{98+2}$ or **M2** for $\frac{y}{2} = \frac{\sqrt{98+2}}{\sqrt{7+2}}$

435. 0580_w16_ms_21 Q: 18

	Answer	Mark	Partial Marks
(a)	4	**2**	**B1** for 25 or –21
(b)	$\sqrt{y-qr}$ oe final answer	**2**	**M1** for $y - qr = p^2$ or **M1** for correctly square rooting *their* function of y, q and r

436. 0580_w16_ms_21 Q: 19

	Answer	Mark	Partial Marks
(a)	$6n + 1$ oe final answer	**2**	**B1** for $6n + c$ or for $kn + 1$ ($k \neq 0$)
(b)	$(n+2)^2$ final answer	**2**	**M1** for any quadratic expression or reaching second difference of 2

437. 0580_w16_ms_21 Q: 21

	Answer	Mark	Partial Marks
	$y \geqslant 0$ and $x \geqslant 1$ oe and $x + y \leqslant 4$ oe	**4**	**SC3** for $y > 0$, $x > 1$ and $x + y < 4$ oe or **B1** for $y \geqslant 0$ **B1** for $x \geqslant 1$ oe and **B2** for $x + y \leqslant 4$ oe or **M1** for grad = –1 soi If **B0** scored for first two **B** marks, **SC1** for $y = 0$ and $x = 1$ or with incorrect inequality sign

438. 0580_w16_ms_21 Q: 23

	Answer	Mark	Partial Marks
	$\sqrt{(3)^2 - 4(2)(-3)}$ oe or better	**B1**	If completing the square, **B1** for $\left(x + \frac{3}{4}\right)^2$ oe
	$\frac{-3 + \sqrt{k}}{2(2)}$ or $\frac{-3 - \sqrt{k}}{2(2)}$ oe	**B1**	**B1** for $-\frac{3}{4} + \sqrt{\frac{3}{2} + \left(\frac{3}{4}\right)^2}$ or $-\frac{3}{4} - \sqrt{\frac{3}{2} + \left(\frac{3}{4}\right)^2}$ oe
	–2.19, 0.69	**B1B1**	**SC1** for –2.2 or –2.186… **and** 0.7 or 0.686.. or –2.19 **and** 0.69 seen but not final answer or 2.19 **and** –0.69 **Maximum score without working is 2**

439. 0580_w16_ms_22 Q: 3

	Answer	Mark	Partial Marks
	21	**2**	**M1** for $k - 8 = 13$ or $6k - 48 = 78$ or better

440. 0580_w16_ms_22 Q: 5

	Answer	Mark	Partial Marks
	$9y^3$ final answer	**2**	**B1** for $9y^k$, $9 \times y^3$ or ky^3 ($k \neq 0$) as final answer

441. 0580_w16_ms_22 Q: 7

	Answer	Mark	Partial Marks
	1, 2, 3	**3**	**B2** for $t < 4$ or **M1** for $2 + 6 > 3t - t$ oe or better If zero scored, **SC1** for answer 0, 1, 2, 3 or 1, 2, 3, 4

442. 0580_w16_ms_22 Q: 8

	Answer	Mark	Partial Marks
	correctly eliminating one variable [x =] 9 [y =] 3.5	**M1** **A1** **A1**	 If zero scored, **SC1** for 2 values satisfying one of the original equations **SC1** if no working shown but 2 correct answers given

443. 0580_w16_ms_22 Q: 13

	Answer	Mark	Partial Marks
(a)	$m(m^2+1)$ final answer	**1**	
(b)	$(5-y)(5+y)$ final answer	**1**	
(c)	$(x-4)(x+7)$ final answer	**2**	**B1** for $(x-4)(x+7)$ seen then spoiled or **M1** for $(x+a)(x+b)$ where $ab = -28$ or $a + b = 3$ or for $x(x+7) - 4(x+7)$ or $x(x-4) + 7(x-4)$

444. 0580_w16_ms_23 Q: 1

	Answer	Mark	Partial Marks
	36	**1**	

445. 0580_w16_ms_23 Q: 2

	Answer	Mark	Partial Marks
	n^7 final answer	**1**	

446. 0580_w16_ms_23 Q: 9

	Answer	Mark	Partial Marks
(a)	*A*	**1**	
(b)	A ruled line joining (65, 23) to (80, 28)	**1**	

447. 0580_w16_ms_23 Q: 13

	Answer	Mark	Partial Marks
	$\frac{2}{9}$ oe, must be a fraction	**2**	**M1** for $2.\dot{2} - 0.\dot{2}$ oe or **B1** for $\frac{k}{9}$

448. 0580_w16_ms_23 Q: 18

	Answer	Mark	Partial Marks
(a)	25	**1**	
(b)	$\frac{x^2-3}{2}$ oe final answer	**1**	
(c)	$2x + 3$ final answer	**2**	**M1** for correct first step, e.g. $x = \frac{y-3}{2}$ or $2y = x - 3$

449. 0580_w16_ms_23 Q: 23

	Answer	Mark	Partial Marks
	$\frac{7n}{2t+3m}$ final answer	**4**	**M1** for $7n(6p - 1)$ seen and **M2** for $(2t + 3m)(6p - 1)$ seen or **M1** for $2t(6p - 1) + 3m(6p - 1)$ or $6p(2t + 3m) - 1(2t + 3m)$

450. 0580_w16_ms_23 Q: 24

	Answer	Mark	Partial Marks
	$y \leqslant -\frac{3}{5}x + 6$ oe $x \geqslant 2$ oe $y > x$ oe final answers	5	**SC4** for $y < -\frac{3}{5}x + 6, x > 2, y \geqslant x$ oe or **B3** for $y \leqslant -\frac{3}{5}x + 6$ oe or **B2** for $y = -\frac{3}{5}x + 6$ oe or **B1** for gradient $= -\frac{3}{5}$ oe soi and **B2** for $x \geqslant 2$ and $y > x$ oe or **B1** for either $x \geqslant 2$ or $y > x$ oe or for $x = 2$ and $y = x$ with incorrect inequalities

451. 0580_m15_ms_22 Q: 4

	Answer	Mark	Partial Marks
	$7p(2p+3q)$	2	**B1** for $7(2p^2+3pq)$ or $p(14p+21q)$

452. 0580_m15_ms_22 Q: 5

	Answer	Mark	Partial Marks
	$18-5n$ oe	2	**M1** for $5n$ or $-5n$

453. 0580_m15_ms_22 Q: 10

	Answer	Mark	Partial Marks
(a)	$x+x+4+x+4=26$ oe	1	
(b)	6[.00] cao	2	**M1** for their linear eqn simplified to $ax=b$

454. 0580_m15_ms_22 Q: 11

	Answer	Mark	Partial Marks
	Correctly eliminating one variable $[x =]$ 6 $[y =] \frac{1}{4}$	M1 A1 A1	 If 0 scored **SC1** for 2 values satisfying one of the original equations **SC1** if no working shown but correct answers given

455. 0580_m15_ms_22 Q: 13

	Answer	Mark	Partial Marks
	12	3	**M1** for $x = k\sqrt[3]{y}$ oe **A1** for $k = 3$ or **M2** for $\frac{6}{\sqrt[3]{8}} = \frac{x}{\sqrt[3]{64}}$ oe

456. 0580_m15_ms_22 Q: 21

		Answer	Mark	Partial Marks
(a)	**(i)**	1	1	
	(ii)	m^7	1	
	(iii)	$2p^2$	2	**SC1** for $2p^k$ or kp^2 $k \neq 0$
(b)		$\frac{2}{5}$ or 0.4	2	**B1** for 3^5 or 3^{5x} or $243^{\frac{1}{5}}$ or $243^{\frac{2}{5}}$ seen

457. 0580_m15_ms_22 Q: 22

	Answer	Mark	Partial Marks
(a)	17	2	**M1** for $[g(-2) =] 4$ seen or for $5x^2 - 3$
(b)	$25x^2 - 30x + 9$ or $(5x-3)^2$ as final answer	2	**M1** for $g(5x-3)$
(c)	$\frac{x+3}{5}$	2	**M1** for $5x = y + 3$ or $x = 5y - 3$ or $\frac{y}{5} = x - \frac{3}{5}$

458. 0580_P15_ms_20 Q: 14

	Answer	Mark	Partial Marks
	(a) 2.84	**2**	**M1** correct substitution of g and ℓ seen
	(b) $\frac{4\pi^2\ell}{T^2}$ oe	**3**	**M1** each correct move but third move marked on answer line

459. 0580_P15_ms_20 Q: 15

	Answer	Mark	Partial Marks
	(a) 156	**4**	**M1** intention to find area under graph **B2** completely correct area statement or **B1** two areas found correctly (or one trapezium area)
	(b) 12	**1ft**	Their **(a)**/13

460. 0580_P15_ms_20 Q: 16

	Answer	Mark	Partial Marks
	(a) 500, 405, 364–365, 295 (…)	**2**	**B2**
	(b) 5 points plotted within correct square	**1**	**P1** ft from table
	correct curve drawn within 1 mm of points plotted	**1**	**C1**
	(c) **(i)** 3.3–3.4	**1**	**B1** ft from their curve or line reading at 350 g
	(ii) Never oe	**1**	

461. 0580_P15_ms_20 Q: 17

	Answer	Mark	Partial Marks
	(a) $\frac{1}{2}$	**2**	**B1** f(–2) seen
	(b) $\sqrt[3]{(x-1)}$ or $\sqrt[3]{x-1}$	**2**	**M1** $x - 1 = y^3$ or $\sqrt[3]{(y-1)}$
	(c) 1 2	**3**	**M2** $(x-1)(x-2) = 0$ or **M1** $(x+a)(x+b) = 0$ where $ab = 2$ or $a + b = -3$ If 0 scored give **M1** for $x^2 - 3x + 2 = 0$

462. 0580_P15_ms_20 Q: 18

	Answer	Mark	Partial Marks
	(a) 4324 cao	**2**	**M1** $\frac{1}{6} \times 23 \times 24 \times 47$ or better
	(b) **(i)** 4, 9	**2**	**B1** either correct
	(ii) $(n+1)^2$ or n^2+2n+1	**1**	
	(c) $\frac{2}{3}n(n+1)(2n+1)$ oe	**2**	**M1** recognising $V_n = 4T_n$

463. 0580_s15_ms_21 Q: 4

	Answer	Mark	Partial Marks
	$2x^2+8x-35$ final answer	**2**	**B1** for 2 correct terms in final answer or **M1** for $2x^2+3x$ or $5x-35$

464. 0580_s15_ms_21 Q: 7

	Answer	Mark	Partial Marks
	$24u^2w^3$ final answer	**2**	**B1** for 2 correct elements in final answer

465. 0580_s15_ms_21 Q: 10

	Answer	Mark	Partial Marks
	2520	**3**	**M2** for $12 \times (1+6) \div 2$ oe or **M1** for 1 area correct If zero scored **B1** for top speed = 720 m per min or total time = 360 sec

466. 0580_s15_ms_21 Q: 11

	Answer	Mark	Partial Marks
(a)	$4n$ oe final answer	**1**	
(b)	$3n^2+8$ oe final answer	**2**	**M1** for a quadratic expression as final answer or $3n^2+8$ oe in working

467. 0580_s15_ms_21 Q: 12

	Answer	Mark	Partial Marks
	18	3	**M2** for $2(2+4)^2 = p(-2+4)^2$ oe **M1** for $p = \frac{k}{(q+4)^2}$ **A1** for $k = 72$

468. 0580_s15_ms_21 Q: 15

	Answer	Mark	Partial Marks
	$y < 8$	1	
	$y \geqslant 6 - x$ oe **and** $y \geqslant x + 2$ oe	3	**B2** for either $y \geqslant 6 - x$ oe **or** $y \geqslant x + 2$ oe or **SC2** for $y = 6 - x$ oe **and** $y = x + 2$ oe or **SC1** for $y > 6 - x$ or $y = 6 - x$ **or** $y > x + 2$ or $y = x + 2$

469. 0580_s15_ms_21 Q: 18

	Answer	Mark	Partial Marks
	Correctly equating one set of coefficients	M1	
	Correct method to eliminate one variable	M1	Dependent on the coefficients being the same for one of the variables Correct consistent use of addition or subtraction using their equations
	$x = 0.8$	A1	If zero scored **SC1** for 2 values satisfying one of the original equations
	$y = -3$	A1	or if no working shown, but 2 correct answers given

470. 0580_s15_ms_21 Q: 20

	Answer	Mark	Partial Marks
(a)	$(p+t)(y+2x)$ final answer	**2**	**B1** for $y(p+t)+2x(p+t)$ or $p(y+2x)+t(y+2x)$
(b)	$7(h+k)(h+k-3)$ final answer	**2**	**B1** for $7\left((h+k)^2-3(h+k)\right)$ or $(h+k)(7(h+k)-21)$

471. 0580_s15_ms_21 Q: 23

	Answer	Mark	Partial Marks
(a)	-13	**1**	
(b)	$-3x-1$ or $5-3(x+2)$	**1**	
(c)	$9x-10$ cao	**2**	**M1** for $5-3(5-3x)$
(d)	$\frac{5-x}{3}$ final answer oe	**2**	**M1** for correct first step e.g. $y+3x=5$ or $\frac{y}{3}=\frac{5}{3}-x$ or $y-5=-3x$ or better or for interchanging x and y, e.g. $x=5-3y$, this does not need to be the first step

y

472. 0580_s15_ms_22 Q: 3

	Answer	Mark	Partial Marks
	$\frac{1}{4}$ or 0.25	**1**	

473. 0580_s15_ms_22 Q: 6

	Answer	Mark	Partial Marks
	8×10^3 or 8000 nfww	**2**	**M1** for $w+4\times10^3=1.2\times10^4$ oe or $5w+20\times10^3=6\times10^4$ oe

474. 0580_s15_ms_22 Q: 8

	Answer	Mark	Partial Marks
	$2n^2 + 3$ oe final answer	**2**	**M1** for a quadratic expression as final answer or $2n^2 + 3$ oe in working

475. 0580_s15_ms_22 Q: 15

	Answer	Mark	Partial Marks
	$\frac{2x-23}{(x+2)(2x-5)}$ final answer	**3**	**B1** for a common denominator of $(x + 2)(2x – 5)$ **B1** for $3(2x – 5) – 4(x + 2)$ or better or **SC2** for final answer $\frac{2x-7}{(x+2)(2x-5)}$ or **SC1** for numerator of $2x – 7$ in final answer

476. 0580_s15_ms_22 Q: 21

	Answer	Mark	Partial Marks
(a)	$m = 2$ $n = –10$	**2**	**B1** for $m = 2$ **B1** for $n = –10$ If 0 scored **SC1** for $(x + 2)^2$ in working or $x^2 + 2mx + m^2 + n$ and equating coefficients $2m[x] = 4[x]$ or $m^2 + n = –6$
(b)	**1.16** or 1.16[2…] from completing square	**2FT**	**FT** dep on negative n **B1** for $(x + \textit{their } m)^2 = –\textit{their } n$ or **SC1** for correct answer from using formula or for both answers 1.16 **and** –5.16 whatever method used

477. 0580_s15_ms_22 Q: 23

	Answer	Mark	Partial Marks
(a)	0.4 or $\frac{2}{5}$	1	
(b)	1430	3	**M2** for correct, complete, area statement e.g. $120 \times 10 + \frac{1}{2} \times 20 \times 8 + \frac{1}{2} \times 30 \times 10$ oe or **M1** for one area calculation e.g. 10×120 or $\frac{1}{2} \times 20 \times 8$ or $\frac{1}{2} \times 30 \times 10$
(c)	11.9 or 11.91 to 11.92	1FT	*their* **(b)** ÷ 120

478. 0580_s15_ms_22 Q: 24

	Answer	Mark	Partial Marks
(a)	$9x^2$	1	
(b)	$\frac{x-5}{3}$	2	**M1** for correct first algebraic step e.g. $y - 5 = 3x$ or $\frac{y}{3} = x + \frac{5}{3}$ or better or for interchanging x and y, e.g. $x = 3y + 5$, this does not need to be the first step
(c)	$9x + 20$ cao final answer	2	**M1** for $3(3x + 5) + 5$

479. 0580_s15_ms_23 Q: 2

	Answer	Mark	Partial Marks
	$3x(3x-2)$ final answer	2	**B1** for $3(3x^2 - 2x)$ or $x(9x - 6)$

480. 0580_s15_ms_23 Q: 5

	Answer	Mark	Partial Marks
	$(2x+1)(x-3)$	2	**B1** for $(2x + a)(x + b)$, where $ab = -3$ or $a + 2b = -5$

481. 0580_s15_ms_23 Q: 9

	Answer	Mark	Partial Marks
	2.8 oe	3	**M2** for $12+2=8x-3x$ or better or **M1** for $3x+12$ or $8x-2$

482. 0580_s15_ms_23 Q: 12

	Answer	Mark	Partial Marks
(a)	5	3	**M2** for $\frac{u\times10}{2}+2u\times10=125$ oe or **M1** for evidence that area represents distance e.g. $\frac{u\times10}{2}$, $2u\times10$ or $3u\times10$
(b)	2	1FT	**FT** $10\div$ *their u* correctly evaluated

483. 0580_s15_ms_23 Q: 13

	Answer	Mark	Partial Marks
(a)	$4x^9$ final answer	2	**B1** for answer kx^9 or $4x^k$ $(k\neq0)$
(b)	$2y^{32}$ final answer	2	**B1** for answer ky^{32} or $2y^k$ $(k\neq0)$

484. 0580_s15_ms_23 Q: 14

	Answer	Mark	Partial Marks
	$\sqrt{1^2-4(2)(-2)}$	B1	If completing the square **B1** for $\left(x+\frac{1}{4}\right)^2$ oe
	If in form $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ $p=-1$, $r=2(2)$ or 4	B1	**B1** for $x=-\frac{1}{4}+\sqrt{1+\left(\frac{1}{4}\right)^2}$ or $x=-\frac{1}{4}-\sqrt{1+\left(\frac{1}{4}\right)^2}$
	– 1.28 0.78	B1 B1	If **0** scored for the last two **B** marks then **SC1** for – 1.3 **and** 0.8 or – 1.281 to – 1.280 **and** 0.781 or 0.7807 to 0.7808 or 1.28 **and** – 0.78 or – 1.28 **and** 0.78 seen in the working

485. 0580_w15_ms_21 Q: 9

	Answer	Mark	Partial Marks
(a)	$(a+3c)(x+y)$ final answer	**2**	**B1** for $a(x+y)+3c(x+y)$ or $x(a+3c)+y(a+3c)$
(b)	$3(a-2b)(a+2b)$ final answer	**3**	**B2** for $3(a-2b)(a+2b)$ seen and then spoiled or $(3a-6b)(a+2b)$ or $(a-2b)(3a+6b)$ or $(a-2b)(a+2b)$ or **B1** for $3(a^2-4b^2)$

486. 0580_w15_ms_21 Q: 12

	Answer	Mark	Partial Marks
	81	**3**	**M1** for $V=k(r+1)^3$ and **A1** for $k=3$ or **M2** for $\frac{V}{24}=\frac{3^3}{2^3}$ oe

487. 0580_w15_ms_21 Q: 13

	Answer	Mark	Partial Marks
	$[\pm]\sqrt{\frac{y-b}{a}}$ oe final answer	**3**	**M1** for correctly subtracting to isolate term in x^2 **M1** for correct division **M1** for the final stage of correctly finding the square root

488. 0580_w15_ms_21 Q: 15

	Answer	Mark	Partial Marks
	$\frac{x+4}{x+1}$ final answer	**4**	**B1** for $(x-4)(x+4)$ and **B2** for $(x-4)(x+1)$ or **SC1** for $(x+a)(x+b)$ where $a+b=-3$ or $ab=-4$

489. 0580_w15_ms_21 Q: 21

	Answer	Mark	Partial Marks
(a)	512	**2**	**B1** for $[f(2)=]8$ or **M1** for $(x^3)^3$ or better
(b)	$6x-2$ or $2(3x-1)$ final answer	**2**	**B1** for $3(2x+1)-5$ or better
(c)	$\frac{1}{2}(x-1)$ oe	**2**	**M1** for correct first step eg $y-1=2x$ or $\frac{y}{2}=x+\frac{1}{2}$ or $x=2y+1$ or better

490. 0580_w15_ms_22 Q: 15

	Answer	Mark	Partial Marks
(a)	$(3w+10)(3w-10)$ final answer	**1**	
(b)	$(m+n)(p-6q)$ oe final answer	**2**	**B1** for $p(m+n)-6q(m+n)$ oe or $m(p-6q)+n(p-6q)$ oe

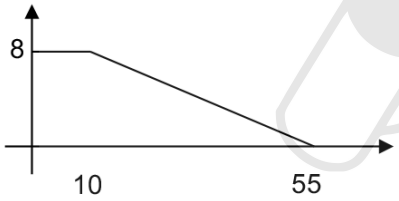
491. 0580_w15_ms_22 Q: 17

	Answer	Mark	Partial Marks
	175	**3**	**M1** for $y=k(x-1)^2$ oe **A1** for $k=7$ or **M2** for $\frac{63}{(4-1)^2}=\frac{y}{(6-1)^2}$ oe

492. 0580_w15_ms_22 Q: 19

	Answer	Mark	Partial Marks
	$\sqrt{(-6)^2 - 4(5)(-3)}$ or better seen	**B1**	If completing the square **B1** for $\left(x - \frac{3}{5}\right)^2$ oe
	if $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ seen then $p = -(-6)$ and $r = 2 \times 5$	**B1**	**B1** for $\frac{3}{5} + \sqrt{\frac{3}{5} + \left(\frac{3}{5}\right)^2}$ or $\frac{3}{5} - \sqrt{\frac{3}{5} + \left(\frac{3}{5}\right)^2}$ oe
	–0.38 1.58 cao final answers	**B1** **B1**	If B0, **SC1** for – 0.4 and 1.6 or – 0.379[795..] and 1.579[795..] or – 1.58 and 0.38 as final answers or – 0.38 and 1.58 seen in working

493. 0580_w15_ms_22 Q: 20

	Answer	Mark	Partial Marks
(a)		**B1** **B1**	line from (0, 8) to (10, 8) line from *their* (10, 8) to (55, 0)
(b)	260	**3FT**	**M2FT** for 8 × 10 + 0.5 × 8 × 45 oe or for a fully correct area calculation for *their* graph or **M1FT** for 8 × 10 or 0.5 × 8 × 45 or for one correct area calculation for *their* graph

494. 0580_w15_ms_23 Q: 6

	Answer	Mark	Partial Marks
	$5 - u$ final answer	**2**	**B1** for $5 + ku$ or $j - u$, $k \neq 0$ as final answer

495. 0580_w15_ms_23 Q: 7

	Answer	Mark	Partial Marks
	$2x(1-2x)$ final answer	2	**B1** for $2(x-2x^2)$ or $x(2-4x)$ as final answer

496. 0580_w15_ms_23 Q: 11

	Answer	Mark	Partial Marks
(a)	$\frac{3x}{2}$ oe final answer	1	
(b)	$\frac{x^2+2}{x}$ oe final answer	1	

497. 0580_w15_ms_23 Q: 16

	Answer	Mark	Partial Marks
	$\frac{2(s-ut)}{t^2}$ oe final answer	3	**M1** for correctly isolating term in a **M1** for correctly multiplying by 2 (or -2) **M1** for correctly dividing by t^2 (or $-t^2$)

498. 0580_w15_ms_23 Q: 17

	Answer	Mark	Partial Marks
	$\frac{x^{16}}{2y^4}$ final answer	3	**B2** for fraction as final answer with two of x^{16}, 2, y^4 correct and in correct position or **B1** for fraction as final answer with one of x^{16}, 2, y^4 correct and in correct position

499. 0580_w15_ms_23 Q: 19

	Answer	Mark	Partial Marks
	$\frac{18}{(x+2)^2}$ oe	2	**M1** for $y=\frac{k}{(x+2)^2}$ or better If zero scored **SC1** for final answer of $y=\frac{k}{(x+2)^2}$ where $k \neq 0$ or 18

500. 0580_w15_ms_23 Q: 21

	Answer	Mark	Partial Marks
	$\sqrt{(4)^2-4(3)(-5)}$ or better seen if $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ seen then	**B1**	If completing the square **B1** for $\left(x+\frac{2}{3}\right)^2$ oe
	$p = -4$ and $r = 2(3)$	**B1**	**B1** for $-\frac{2}{3}+\sqrt{\frac{5}{3}+\frac{2^2}{3^2}}$ or $-\frac{2}{3}-\sqrt{\frac{5}{3}+\frac{2^2}{3^2}}$
	– 2.12 0.79 final answers	**B1** **B1**	If B0, **SC1** for 0.786[299] **and** −2.119[632] – 2.1 **and** 0.8 or – 2.120 or – 2.119 **and** 0.786 or 2.12 and –0.79 final answers –2.12 **and** 0.79 seen not as final answers

501. 0580_w15_ms_23 Q: 22

	Answer	Mark	Partial Marks
	$\frac{1}{2-5w}$ final answer nfww	**4**	**B1** for $2(2+5w)$ **B1** for $2(4-25w^2)$ **B1** for $[2](2+5w)(2-5w)$ ALT method **B3** for $\frac{4+10w}{(4+10w)(2-5w)}$ or **B2** for $(4+10w)(2-5w)$

502. 0580_w15_ms_23 Q: 26

	Answer	Mark	Partial Marks
(a)	12.5 oe	**2**	**M1** for 45 × 1000 ÷ 60 ÷ 60 oe
(b)	1.25 oe	**1FT**	**FT** *their* **(a)** ÷ 10
(c)	312.5 oe	**3FT**	**FT** for 25 × *their* **(a)** **M2** for 20 × *their* 12.5 + 0.5 × 10 × *their* 12.5 oe or **M1** for one correct relevant area calculation or **SC2** for final answer 1125

503. 0580_s14_ms_21 Q: 2

	Answer	Mark	Partial marks
	$18\frac{1}{18}$	2	**M1** for $\frac{2}{36}+\frac{36}{2}$ or better

504. 0580_s14_ms_21 Q: 3

	Answer	Mark	Partial marks
	30	2	**M1** for $n-8=22$ or $\frac{n}{2}=15$

505. 0580_s14_ms_21 Q: 7

	Answer	Mark	Partial marks
	$4\pm\sqrt{y-6}$	3	**M1** for *their* 6 moved correctly **M1** for *their* √ taken correctly **M1** for *their* 4 moved correctly

506. 0580_s14_ms_21 Q: 8

	Answer	Mark	Partial marks
	$\frac{2}{x(x+1)}$	3	**B1** for common denominator $x(x+1)$ seen **M1** for $2(x+1)-2x$ oe or better

507. 0580_s14_ms_21 Q: 10

	Answer	Mark	Partial marks
(a)	$(a+b)(x+y)$	2	**B1** for $a(x+y)+b(x+y)$ or $x(a+b)+y(a+b)$
(b)	$(x-1)(3x-2)$	2	**B1** for $(x-1)(3(x-1)+1)$ If **B0** then **SC1** for $(x+a)(3x+b)$ where $3a+b=-5$ or $ab=2$ or $3(x-1)(x-⅔)$

508. 0580_s14_ms_21 Q: 15

	Answer	Mark	Partial marks
	[0], 1, 2, 3	4	**M1** for moving the 5 correctly **M1** for collecting *their* terms **A1** for a correct inequality for x eg $[0\leq]\ x<4$

509. 0580_s14_ms_21 Q: 16

	Answer	Mark	Partial marks
(a)	8	2	**B1** for 2^{12} or 4096
(b)	$2q^{\frac{3}{2}}$	3	**B2** for $kq^{\frac{3}{2}}$ as the answer or **B1** for $2q^2$ and **B1** for $q^{\frac{1}{2}}$ oe nfww

510. 0580_s14_ms_22 Q: 3

		Answer	Mark	Partial marks
		$[x =] 2, [y =] -3$	2	**B1 B1** or **SC1** for reversed answers

511. 0580_s14_ms_22 Q: 10

		Answer	Mark	Partial marks
	(a)	35	1	
	(b)	$\frac{3V}{A}$ or $3VA^{-1}$	2	**M1** for multiplying by 3 or for dividing by $\frac{1}{3}$ or **M1** for dividing by A

512. 0580_s14_ms_22 Q: 12

		Answer	Mark	Partial marks
		$-\frac{3}{5}$ oe	3	**B2** for $5x + 3 = 0$ oe or **B1** for a numerator of $3(x+1)+2x[=0]$ seen

513. 0580_s14_ms_22 Q: 13

		Answer	Mark	Partial marks
		1.6 oe	3	**M1** for $w=\frac{k}{\sqrt{x}}$ **A1** for $k=8$ Alternative method: **M2** for $w\sqrt{25}=4\sqrt{4}$ oe

514. 0580_s14_ms_22 Q: 16

		Answer	Mark	Partial marks
	(a)	$2pq(2p-3q)$	2	**B1** for $pq(4p-6q)$ or $2q(2p^2-3pq)$ or $2p(2pq-3q^2)$
	(b)	$(u+4t)(1+x)$	2	**B1** for $1(u+4t)+x(u+4t)$ or $u(1+x)+4t(1+x)$

515. 0580_s14_ms_22 Q: 17

		Answer	Mark	Partial marks
	(a)	$5t^{25}$	2	**B1** for $5t^k$ or mt^{25} $(m\neq 0)$
	(b)	–2	1	
	(c)	64	1	

516. 0580_s14_ms_22 Q: 19

		Answer	Mark	Partial marks
		$\frac{x-1}{3}$ final answer	4	**B2** for $(x-1)(x+7)$ or **SC1** for $(x+a)(x+b)$ where $ab = -7$ or $a+b=6$ **B1** for $3(x+7)$

517. 0580_s14_ms_22 Q: 20

		Answer	Mark	Partial marks
	(a)	–3	**1**	
	(b)	$39 - 7n$ oe	**2**	**M1** for $-7n$ [+ k]
	(c)	53	**2**	**M1** for *their* (b) = –332 shown provided *their*(b) is linear and their answer for (c) is a positive integer

518. 0580_s14_ms_23 Q: 4

		Answer	Mark	Partial marks
		$5a(3a^2 - b)$	**2**	**B1** for $a(15a^2 - 5b)$ or $5(3a^3 - ab)$

519. 0580_s14_ms_23 Q: 6

		Answer	Mark	Partial marks
		$3x^6y^4$	**2**	**B1** for x^6 or y^4 in a product on answer line

520. 0580_s14_ms_23 Q: 9

		Answer	Mark	Partial marks
		$t < -\frac{6}{7}$	**2**	**M1** for $5t + 2t < 17 - 23$ If zero scored **SC1** for $-\frac{6}{7}$ with incorrect inequality sign or equals sign

521. 0580_s14_ms_23 Q: 11

		Answer	Mark	Partial marks
		3.5	**3**	**M1** for $y = k\sqrt[3]{x+3}$ **A1** for $k = \frac{1}{2}$ Alternative method: **M2** for $\frac{y}{\sqrt[3]{340+3}} = \frac{1}{\sqrt[3]{5+3}}$ oe

522. 0580_s14_ms_23 Q: 12

		Answer	Mark	Partial marks
	(a)	$(3x-4)(x+2)$	2	**M1** for $(3x+a)(x+b)$ where $a+3b=2$ *or* $ab=-8$ if M0 then **SC1** for $3\left(x-\frac{4}{3}\right)(x+2)$
	(b)	$1\frac{1}{3}$, -2	1FT	**dep** on **M1**

523. 0580_s14_ms_23 Q: 19

		Answer	Mark	Partial marks
		$3x+4y=10.8$ $5x+2y=14.50$	1 1	
		2.6[0] 0.75	3	**M1 FT** for correctly eliminating one variable **Al** for 2.6 **A1** for 0.75 If **M0** then or **SC1** for correct substitution and correct evaluation to find the other value

524. 0580_w14_ms_21 Q: 10

	Answer	Mark	Partial marks
	3.75 oe	3	**M2** for $3\times5=7x-3x$ oe or **M1** for $3(x+5)=7x$ or $x+5=\frac{7}{3}x$ or $1+\frac{5}{x}=\frac{7}{3}$ or better

525. 0580_w14_ms_21 Q: 11

	Answer	Mark	Partial marks
(a)	x^6	1	
(b)	$\frac{x^2}{3}$	2	**B1** for answer kx^2 or $\frac{x^k}{3}$ or $\frac{1}{3}$

526. 0580_w14_ms_21 Q: 12

	Answer	Mark	Partial marks
	$\begin{matrix}5\\-5\end{matrix}$ nfww	3	**M1** for correctly eliminating one variable **A1** for $x = 5$ **A1** for $y = -5$ If zero scored **SC1** for correct substitution and evaluation to find the other variable

527. 0580_w14_ms_21 Q: 13

	Answer	Mark	Partial marks
	[±] 8 nfww	3	**M1** for $y = k\sqrt{x+5}$ **A1** for k = [±] 2 or **M2** for $\frac{4}{\sqrt{-1+5}} = \frac{y}{\sqrt{11+5}}$ oe

528. 0580_w14_ms_21 Q: 20

	Answer	Mark	Partial marks
(a)	0.4 or $\frac{2}{5}$	2	**B1** for [f(2) =] 4 or **M1** for $\frac{2}{(3x-2)+1}$ or better
(b)	–0.8 or $-\frac{4}{5}$	2	**M1** for $2 = 10(x+1)$ or better
(c)	$3x-6$ or $3(x-2)$ nfww	3	**M2** for $3(2x)-2-(3(x+2)-2)$ or **M1** for $[f(2x)=]3(2x)-2$ or $[f(x+2)]=3(x+2)-2$

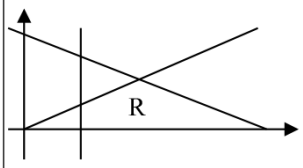
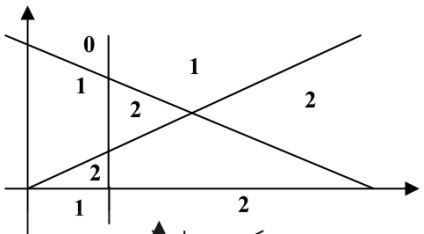
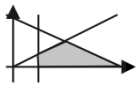
529. 0580_w14_ms_22 Q: 5

	Answer	Mark	Partial marks
	$v^3 - p$	2	**M1** for $v^3 = p + r$

530. 0580_w14_ms_22 Q: 10

	Answer	Mark	Partial marks
	97.2[0]	3	**M1** for $C = kr^2$ **A1** for $k = 30$ or **M2** for $\frac{202.8}{2.6^2} = \frac{c}{1.8^2}$ oe

531. 0580_w14_ms_22 Q: 12

	Answer	Mark	Partial marks
		3	 **SC1** for 

532. 0580_w14_ms_22 Q: 21

	Answer	Mark	Partial marks
(a)	$\frac{x+7}{(2x-1)(x+2)}$ Final answer	3	**B1** for $3(x+2)-1(2x-1)$ seen or better **B1** for denominator $(2x-1)(x+2)$ oe seen **SC2** for final answer $\frac{x+5}{(2x-1)(x+2)}$
(b)	$\frac{2x}{x+7}$ Final answer	4	**M1** for $4x(x-4)$ or partial factorisation of numerator and **M2** for $[2](x+7)(x-4)$ oe or **M1** for $[2](x^2+3x-28)$ or $[2](x+a)(x+b)$ where $ab = -28$ or $a+b=3$ **SC3** for answer $\frac{4x}{2x+14}$ oe

533. 0580_w14_ms_23 Q: 6

	Answer	Mark	Partial marks
	9.5 or $\frac{19}{2}$	3	**M2** for $2x = (8 \times 3) - 5$ or better oe or **M1** for $2x + 5 = 8 \times 3$ or better

534. 0580_w14_ms_23 Q: 8

	Answer	Mark	Partial marks
	$8 + (y - 2)^2$ oe final answer	3	**M1** for $y - 2 = \sqrt{(x - 8)}$ **M1** for squaring both sides completed correctly **M1** for adding *their* 8 completed correctly on answer line

535. 0580_w14_ms_23 Q: 9

	Answer	Mark	Partial marks
	4	3	**M2** for $6(3 + 5) = y(7 + 5)$ oe or **M1** for $y = \frac{k}{x + 5}$ oe **A1** for $k = 48$

536. 0580_w14_ms_23 Q: 11

	Answer	Mark	Partial marks
(a)	608 400 cao	2	**M1** for $\frac{1}{4} \times 39^2 \times (39 + 1)^2$
(b)	$2n^2(n + 1)^2$ oe	1	

537. 0580_w14_ms_23 Q: 13

	Answer	Mark	Partial marks
	$\frac{16x^2 + 18x + 9}{6x}$ final answer	4	**M2** for 9 [+] $4x^2$ [+] $18x$ [+] $12x^2$ or better or **M1** for 2 of these and **M1FT** for adding their four 'numerators' together correctly and **B1** for denominator $6x$ to a maximum of **3** marks

538. 0580_w14_ms_23 Q: 16

	Answer	Mark	Partial marks
(a)	64	**2**	**B1** for [f(1) =] 4 or **M1** for $((x-3)^2)^3$ or better
(b)	$4x + 1$ oe	**2**	**M1** for $x = \frac{y-1}{4}$ or $4y = x - 1$
(c)	$\frac{x^3-1}{4}$ oe final answer	**1**	
(d)	3 nfww	**1**	

539. 0580_s13_ms_21 Q: 6

	Answer	Mark	Partial marks
	$3x(4y - x)$ final answer	**2**	**B1** for $3(4xy - x^2)$ or $x(12y - 3x)$

540. 0580_s13_ms_21 Q: 8

	Answer	Mark	Partial marks
	$x \geq -\frac{3}{8}$ oe	**2**	**M1** for $-3 \leq 8x$ oe If 0 then **SC1** for $-\frac{3}{8}$ with incorrect inequality.

541. 0580_s13_ms_21 Q: 10

	Answer	Mark	Partial marks
	$(a + b)(p - 2)$	**2**	**B1** $p(a + b) - 2(a + b)$ or $a(p - 2) + b(p - 2)$

542. 0580_s13_ms_21 Q: 11

	Answer	Mark	Partial marks
	$3x^4$	**2**	**B1** for kx^4 or $3x^k$

543. 0580_s13_ms_21 Q: 18

	Answer	Mark	Partial marks
(a)	$(x + 6)(x–5)$	**2**	**SC1** for $(x + a)(x + b)$ where $ab = –30$ or $a + b$
(b)	$\frac{x+4}{x+6}$ final answer	**1**	

544. 0580_s13_ms_21 Q: 19

	Answer	Mark	Partial marks
	$\frac{6}{7}$ or 0.857[1…]	**3**	**M1** for $t = \frac{k}{\sqrt{u}}$ oe **A1** for $k = 6$

545. 0580_s13_ms_21 Q: 22

	Answer	Mark	Partial marks
	$\frac{5x+13}{(x+3)(x+2)}$ oe final answer	**3**	**B1** for common denominator $(x + 3)(x + 2)$ seen **M1** for $2(x + 2) + 3(x + 3)$ soi

546. 0580_s13_ms_21 Q: 25

	Answer	Mark	Partial marks
(a)	2.8 oe	**1**	
(b)	700	**3**	**M2** for ½(20 + 30) × 28 oe or **M1** for a correct area statement

547. 0580_s13_ms_22 Q: 2

	Answer	Mark	Partial marks
	$(p + 3)(k + m)$	**2**	**B1** for $k(p + 3) + m(p + 3)$ or $p(k + m) + 3(k + m)$

548. 0580_s13_ms_22 Q: 3

	Answer	Mark	Partial marks
	$17 – 4n$	**2**	**B1** for $\pm 4n$ seen

549. 0580_s13_ms_22 Q: 12

	Answer	Mark	Partial marks
	14.5 oe	**3**	**M2** for complete correct method or **M1** for one correct step

550. 0580_s13_ms_22 Q: 14

	Answer	Mark	Partial marks
	0.625 oe	**3**	**M1** for $y = \frac{k}{x^3}$ **A1** for $k = 40$

551. 0580_s13_ms_22 Q: 15

	Answer	Mark	Partial marks
	$\frac{-7 \pm \sqrt{7^2 - 4(2)(-3)}}{2 \times 2}$	**B2**	**B1** for $\sqrt{7^2 - 4(2)(-3)}$ or better seen **B1** for $p = -7$ and $r = 2 \times 2$ or better as long as in the form $\frac{p + \sqrt{q}}{r}$ or $\frac{p - \sqrt{q}}{r}$
	0.39, –3.89 cao	**B1,B1**	After **B0B0** for the two answers, **SC1** for 0.4 or 0.386[0009...] and –3.9 or –3.886[0009...] or **SC1** for −0.39 and 3.89

552. 0580_s13_ms_22 Q: 16

	Answer	Mark	Partial marks
	15	**4**	**M2** for $\frac{1}{2} \times 40 \times (26 + 19)$ oe or **M1** for one valid area calculation **Indep M1** for ÷ 60 **SC3** for answer 900

553. 0580_s13_ms_22 Q: 18

	Answer	Mark	Partial marks
	-1 -2 -3 -4	4	**B3** for $x < -\frac{3}{5}$ and $x > -4.5$ oe or **B2** for $x < -\frac{3}{5}$ or $x > -4.5$ oe or **B1** for $5x < -3$ or $-9 < 2x$ oe Or mark on answer line -1 oe

554. 0580_s13_ms_22 Q: 21

	Answer	Mark	Partial marks
(a)	4.5 oe	2	**B1** for [g(5)=] 0.1 oe
(b)	x	2	**M1** for $\frac{1}{2\left(\frac{1}{2x}\right)}$ seen oe
(c)	$\frac{x-4}{5}$ oe	2	**M1** for a correct first step e.g. $y - 4 = 5x$ or $\frac{y}{5} = x + \frac{4}{5}$ or $x = 5y + 4$
(d)	-3	2	**M1** for $\left(\frac{1}{2}\right)^{-3} = 8$ or $\left(\frac{1}{2}\right)^{x} = \left(\frac{1}{2}\right)^{-3}$ or $2^{x} = \frac{1}{8}$ oe or $2^{-x} = 2^{3}$

555. 0580_s13_ms_23 Q: 8

	Answer	Mark	Partial marks
	2500	3	**M1** for $m = kr^3$ **A1** for $k = 20$

556. 0580_s13_ms_23 Q: 10

	Answer	Mark	Partial marks
	25	4	**M1** for correct method to eliminate one variable **A1** for $x = 11$ **A1** for $y = 3$ **B1 FT** for $2 \times$ *their* $x +$ *their* y correctly evaluated

557. 0580_s13_ms_23 Q: 13

	Answer	Mark	Partial marks
	$\frac{8x}{(x-3)(x+1)}$	4	**B1** for common denominator $(x-3)(x+1)$ seen **B1** for $(x+3)(x+1)-(x-1)(x-3)$ soi **B1** for $x^2+3x+x+3$ or $x^2-3x-x+3$ soi

558. 0580_s13_ms_23 Q: 14

	Answer	Mark	Partial marks
(a)	$n < 9$	2	**M1** for $2n < 18$ or $2n - 18 < 0$ oe If 0 scored **SC1** for 9 with incorrect inequality.
(b)	$(b+d)(a+c)$	2	**B1** for $b(a+c)+d(a+c)$ or $a(b+d)+c(b+d)$

559. 0580_s13_ms_23 Q: 16

	Answer	Mark	Partial marks
(a)	1.5	2	**B1** for [g(18) =] 4
(b)	$2(x+5)$ or $2x+10$	2	**M1** for correct first step e.g. $x=\frac{y}{5}-5$ or $\frac{x}{2}=y+5$ or $2y=x-10$

560. 0580_s13_ms_23 Q: 20

	Answer	Mark	Partial marks
(a)	[±] 3.1623 cao	2	**M1** for $\sqrt{10}$ seen
(b)	$\frac{4}{y^2-8}$ oe final answer	4	**M1** first move completed correctly **M1** second move completed correctly **M1** third move completed correctly **M1** final move completed correctly on answer line

561. 0580_w13_ms_21 Q: 5

	Answer	Mark	Partial marks
	4.8 oe	2	**M1** for $5 + 19 = 3x + 2x$ oe or better or **B1** for $24 - 2x = 3x$ oe or $5 = 5x - 19$ oe

562. 0580_w13_ms_21 Q: 9

	Answer	Mark	Partial marks
	(a) $\frac{n}{n+2}$ oe final answer	1	
	(b) n^2-1 oe final answer	2	**B1** for any quadratic in final answer

563. 0580_w13_ms_21 Q: 10

	Answer	Mark	Partial marks
	$[\pm]\sqrt{c^2-a^2}$ oe final answer	3	**M1** for correct square **M1** for correct re-arrangement **M1** for correct square root

564. 0580_w13_ms_21 Q: 13

	Answer	Mark	Partial marks
	(a) $\frac{5}{4}$ oe	1	
	(b) $4y^6$	2	B1 for ky^6 or y^6 or $4y^k$ or 4 as final answer

565. 0580_w13_ms_21 Q: 14

	Answer	Mark	Partial marks
	$\frac{2t-5}{t-1}$ final answer	3	**B1** for $\frac{3(t-1)}{t-1}$ or better **B1** for $3(t-1)-(t+2)$ oe or better

566. 0580_w13_ms_21 Q: 17

	Answer	Mark	Partial marks
	(a) $(a + b)(1 + t)$	**2**	**B1** for 1(a + b) + t(a + b) or $a(1 + t) + b(1 + t)$
	(b) $(x - 6)(x + 4)$	**2**	**SC1** for answer of $(x + a)(x + b)$ where $ab = -24$ or $a + b = -2$

567. 0580_w13_ms_22 Q: 6

	Answer	Mark	Partial marks
	$[\pm]\sqrt{y-4}$ final answer	**2**	**M1** for first move completed correctly **M1** for second move completed correctly on answer line

568. 0580_w13_ms_22 Q: 11

	Answer	Mark	Partial marks
	120	**3**	**M1** for $v = \frac{k}{\sqrt{d}}$ **A1** for $k = 600$

569. 0580_w13_ms_22 Q: 15

	Answer	Mark	Partial marks
	(8, 2)	**3**	**M1** for correctly eliminating one variable **A1** for $x = 8$ **A1** for $y = 2$ If 0 scored, **SC2** for correct substitution and correct evaluation to find the other value.

570. 0580_w13_ms_22 Q: 16

	Answer	Mark	Partial marks
	$x < 6.8$	**4**	**B3** for 6.8 with wrong inequality or equal as answer. Or **M1** for first move completed correctly and **M1** for second move completed correctly and **M1** for third move completed correctly

571. 0580_w13_ms_23 Q: 3

	Answer	Mark	Partial marks
	–8	2	**M1** for $2x = -16$ or $\frac{1}{2} + x = -7.5$ oe or better

572. 0580_w13_ms_23 Q: 7

	Answer	Mark	Partial marks
	5	3	**M2** for $(x - 5)(x - 1)$ or **M1** for evidence of a factorisation which gives the correct coefficient of x or positive prime constant term e.g. $(x - 7)(x + 1)$, $(x - 4)(x - 2)$, $(x - 3)(x - 1)$

573. 0580_w13_ms_23 Q: 9

	Answer	Mark	Partial marks
	(a) $a^2 + 2ab + b^2$	2	**B1** for a^2 [+] ab [+] ab [+] b^2 or better seen
	(b) 22	1	

574. 0580_w13_ms_23 Q: 14

	Answer	Mark	Partial marks
	(a) $8q^{-1}$ or $\frac{8}{q}$	2	**B1** for $8q^k$ or kq^{-1}
	(b) 1/5 or 0.2	2	**M1** for 5^{-2}, $\frac{1}{5^2}$ or [0].04 seen oe

575. 0580_w13_ms_23 Q: 19

	Answer	Mark	Partial marks
	(a) 75	**2**	**B1** for [g(6) =] 36
	(b) 3.5 –6.5	**3**	**M1** for $(2x + 3)^2 = 100$ **M1** for $2x + 3 = [\pm]10$ If 0 scored, **SC1** for one correct value as answer
	(c) $\frac{x-3}{2}$ oe final answer	**2**	**M1** for $x = 2y + 3$ or $y - 3 = 2x$ or $\frac{y}{2} = x + \frac{3}{2}$ or better
	(d) 5	**1**	

576. 0580_s12_ms_21 Q: 3

	Answer	Mark	Partial marks
	$3p(5p + 8t)$ final answer	**2**	**B1** for answer of $3(5p^2 + 8pt)$ or $p(15p + 24t)$ **or SC1** for correct answer seen in working

577. 0580_s12_ms_21 Q: 8

	Answer	Mark	Partial marks
	9	**2**	**M1** $125 = 5^3$

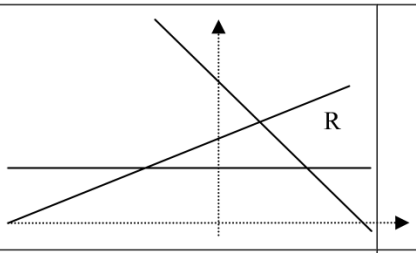
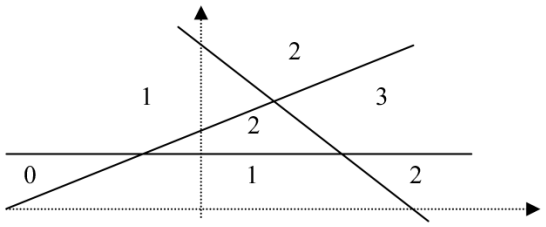
578. 0580_s12_ms_21 Q: 11

	Answer	Mark	Partial marks
	$x = -7$ $y = 9$	**3**	**M1** for consistent multiplication and addition/ subtraction as appropriate. Allow computational errors **A1** for $x = -7$ **or** $y = 9$

579. 0580_s12_ms_21 Q: 13

	Answer	Mark	Partial marks
	1.92	**3**	**M1** $y = \frac{k}{x^2}$ oe **B1** for $k = 48$

580. 0580_s12_ms_21 Q: 14

Answer	Mark	Partial marks
	3	

581. 0580_s12_ms_21 Q: 17

Answer	Mark	Partial marks
$w = \frac{4-3c}{c-1}$ www	4	**M1** clearing denominator and removing brackets **M1** correctly collecting terms in w on one side only **M1** factorising correctly **M1** divide by coefficient of w

582. 0580_s12_ms_21 Q: 18

	Answer	Mark	Partial marks
(a)	0.8	1	
(b)	1850	4	**M1** for area = distance travelled **M1** for two correct area statements **M1** for complete correct area statement

583. 0580_s12_ms_22 Q: 6

Answer	Mark	Partial marks
1, 2, 3, 4	3	**M1** $10x < 45$ **A1** $x < 4.5$

584. 0580_s12_ms_22 Q: 10

	Answer	Mark	Partial marks
(a)	50	1	
(b)	15	2	**M1** finding area under graph **SC1** 15000

585. 0580_s12_ms_22 Q: 11

	Answer	Mark	Partial marks	
	196	3	**M1** $y = k(x-3)^2$ **A1** $k = 4$	**M1** $y = \frac{(x-3)^2}{k}$ **A1** $k = \frac{1}{4}$

586. 0580_s12_ms_22 Q: 16

	Answer	Mark	Partial marks
(a)	0.7 to 0.8 and 5.2 to 5.4	2	**B1 B1**
(b)	–2 to –1 but must have a tangent at $x = 1$ for full marks	3	**M1** drawing tangent at $x = 1$ **M1** for using $y$step/$x$step on their tangent wherever it is drawn

587. 0580_s12_ms_22 Q: 18

	Answer	Mark	Partial marks
(a)	$2(x+2)^3$ or $2x^3 + 12x^2 + 24x + 16$	2	**M1** v. clear evidence of f(x) × 2 then add 10
(b)	$\sqrt[3]{(x+5)} - 2$	3	**M1** correct first step **M1** correct second step
(c)	0	2	**M1** g(–5) seen or 2 × –5 + 10

588. 0580_s12_ms_23 Q: 4

	Answer	Mark	Partial marks
	$y \varnothing -1.25$	2	**M1** inequality with y's and constants correctly collected

589. 0580_s12_ms_23 Q: 9

	Answer	Mark	Partial marks
	$\frac{a(2-t)}{3}$ cao oe	3	**M1** correct re-arrangement to isolate the term in w **M1** correct multiplication by a **M1** correct division by their 3 An incorrect answer scores a maximum of **M2**

590. 0580_s12_ms_23 Q: 10

	Answer	Mark	Partial marks
	10	3	**M1** $T = k\sqrt{l}$ **A1** for $k = 2$

591. 0580_s12_ms_23 Q: 13

	Answer	Mark	Partial marks
(a)	71	2	**M1** for $7\times8 - 3\times-5$ or **B1** 56 and –15
(b)	$3v\,(u + 3w)$ final answer	2	**B1** for $3(uv + 3vw)$ or $v\,(3u + 9w)$ As final answer

592. 0580_s12_ms_23 Q: 14

	Answer	Mark	Partial marks
(a)	$64p^3q^6$	2	**B1** $64p^uq^v$ or kp^3q^6
(b)	$0.5x^{-2}$ or $\frac{1}{2x^2}$ oe	2	**B1** $\frac{1}{2x^u}$ oe or $\frac{1}{kx^2}$ oe

593. 0580_s12_ms_23 Q: 15

	Answer	Mark	Partial marks
	–3.44, 0.44 correct working must be shown	4	**B1** for $\sqrt{(6)^2 - 4(2)(-3)}$ or better seen **B1** if in form $\frac{p + (or -)q}{r}$, for $p = -6$ **and** $r = 2\times2$ oe **B1, B1** (**SC1** –3.4 or –3.436… **and** 0.4 or 0.436...)

594. 0580_s12_ms_23 Q: 19

	Answer	Mark	Partial marks
	6(.00) **www**	4	**M1** use of area = distance **M1** complete, correct set of area statements, ignoring units **M1** changing min to hours or km/h to km/min

595. 0580_s12_ms_23 Q: 20

	Answer	Mark	Partial marks
	$\frac{x+4}{x(x-5)}$ oe cao	5	**B2** $(x-5)(x+4)$ seen or **SC1** $(x+a)(x+b)$ where $ab=-20$ or $a+b=-1$ **B2** $x(x-5)(x-5)$ or **B1** one of $x(x^2-10x+25)$, $(x-5)(x-5)$, $(x-5)(x^2-5x)$ seen

596. 0580_w12_ms_21 Q: 5

	Answer	Mark	Partial marks
	$a^{(1)}-b^{(1)}$ **www** cao	2	**M1** for $a^{½}a^{½}-a^{½}b^{½}+a^{½}b^{½}-b^{½}b^{½}$ oe

597. 0580_w12_ms_21 Q: 9

	Answer	Mark	Partial marks
	$x \leqslant 39$ **www**	3	**M1** correct first move **M1** correct 2nd move **M1** correct move to answer line

598. 0580_w12_ms_21 Q: 11

	Answer	Mark	Partial marks
	2.5	3	**M1** $R=k/d^2$ **A1** $k=40$ or **M1** $Rd^2=k$ **A1** $k=40$

599. 0580_w12_ms_21 Q: 15

	Answer	Mark	Partial marks
	180 **www**	3	**M1** ½ × 60 × 14 oe **M1** their 420 – 4 × 60

600. 0580_w12_ms_21 Q: 16

	Answer	Mark	Partial marks
	$\frac{4y+2}{y-1}$ oe	4	**M1** $xy-4y=x+2$ **M1** collecting terms in x on one side **M1** factorising **M1** dividing by coeff of x

601. 0580_w12_ms_21 Q: 20

	Answer	Mark	Partial marks
	(a) 12	**1**	
	(b) $2x^3$ cao	**2**	**M1** clear evidence of adding 1 then multiplying by 4 to g(x)
	(c) $\sqrt[3]{2(x+1)}$ oe	**3**	**M1** each correct move

602. 0580_w12_ms_22 Q: 3

	Answer	Mark	Partial marks
	118.75 or $118\frac{3}{4}$ cao	**2**	**M1** $3(20)^2 + 8(20)(–5) + 3(–5)^2$ or better

603. 0580_w12_ms_22 Q: 10

	Answer	Mark	Partial marks
	3.4 or $3\frac{2}{5}$	**3**	**M1** $22 – 6x$ **M1** $4x + 6x = 22 + 12$

604. 0580_w12_ms_22 Q: 11

	Answer	Mark	Partial marks
	11, 13, 17, 19, 23	**3**	**B2** 3 or 4 correct or **B1** 2 correct If **B0** then **M1** for $x > 10.5$ and **M1** for $x < 26.5$ or **M1** for 10.5 and 26.5 seen

605. 0580_w12_ms_22 Q: 13

	Answer	Mark	Partial marks
	686	**3**	**M1** $m = k L^3$ **A1** $k = 2$

606. 0580_w12_ms_22 Q: 14

	Answer	Mark	Partial marks
	(a) $p = \frac{3}{8}$ $q = \frac{1}{2}$	2	**B2** $p = \frac{9}{64}$ **and** $q = \frac{1}{4}$ or **B1** $p = \frac{3}{8}$ $q \neq \frac{1}{2}$
	(b) k = 6	2	**M1** for a correct statement for k e.g. $\frac{5^{-3}+5^{-4}}{5^{-4}}$ or for the factorisation $5^{-4}(5+1) = k \times 5^{-4}$ or $\frac{1}{625}(5+1) = \frac{k}{625}$

607. 0580_w12_ms_22 Q: 15

	Answer	Mark	Partial marks
	(a) 3	1	
	(b) 637.5	3	**M1** finding area under graph **M1dep** all correct area statements

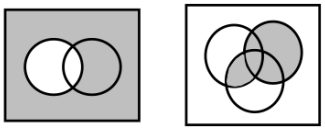
608. 0580_w12_ms_22 Q: 19

	Answer	Mark	Partial marks
	(a) 5	2	**M1** f(2) = seen
	(b) $3x^2 + 1$	3	**M1** $9x^2 + 1$ **M1** ("$9x^2 + 1$" + 2)/3 seen
	(c) $3x - 2$	2	**M1** for $3y = x + 2$ or $x = \frac{y+2}{3}$

609. 0580_w12_ms_23 Q: 4

	Answer	Mark	Partial marks
	$3y - y^4$ final answer	2	**B1** for $3y$ or $-y^4$ as part of two term expression

610. 0580_w12_ms_23 Q: 9

	Answer	Mark	Partial marks
		2	**B1** for one correct

611. 0580_w12_ms_23 Q: 11

	Answer	Mark	Partial marks
	$4w^{64}$	2	**B1** for $4w^{n}$ or kw^{64}

612. 0580_w12_ms_23 Q: 13

	Answer	Mark	Partial marks
	$\frac{23-2x}{12}$	3	**M1** for two correct algebraic fractions with a common denominator of 12 **M1** for correctly collecting their terms **M1** for dealing correctly with the 1

613. 0580_w12_ms_23 Q: 14

	Answer	Mark	Partial marks
	3, –3 or ±3	3	**M1** for $y = k/\sqrt{x}$ oe **A1** for 18

614. 0580_w12_ms_23 Q: 16

	Answer	Mark	Partial marks
	$\sqrt{\frac{\pi x^2 - A}{\pi}}$ oe	3	**M1** for one correct move **M1** for second correct move **M1** for third correct move

615. 0580_w12_ms_23 Q: 19

	Answer	Mark	Partial marks
	(a) 0.625 or 5/8	1	
	(b) 62	3	**M1** for area under graph implied **M1** for correct, complete, area statement

616. 0580_w12_ms_23 Q: 21

	Answer	Mark	Partial marks
	$\frac{h+4}{h+5}$	4	**B2** for $(h-5)(h+4)$ seen **B1** for $(h-5)(h+5)$ If **B2** not scored then **SC1** for $(h+a)(h+b)$ where $a+b=-1$ or $ab=-20$

617. 0580_w12_ms_23 Q: 23

	Answer		Mark	Partial marks
	(a)	43	**2**	**M1** for g(11) or $4[4(3) - 1] - 1$
	(b)	$12x + 2$	**2**	**M1** for $3(4x - 1) + 5$
	(c)	38	**1**	