

01. 0607_m24_ms_42 Q: 2

Question	Answer	Marks	Partial Marks
(a)	4.5[0]	2	M1 for $A \times \left(1 + \frac{8}{100}\right) = 4.86$ oe
(b)	296.9[0]	3	M1 for $8 [\times 5] \times 4.7[0]$ oe M1 for $[5 \times] 18 \times 1.21$ oe
(c)(i)	$\frac{480}{x-6}$ oe	1	
(c)(ii)	$\frac{480}{x} + \frac{480}{x-6} = 36$ oe	M1	Allow $\frac{480}{x} + \text{their}(i) = 36$
	$480(x-6) + 480x = 36x(x-6)$ oe	M1	Clearing fractions correctly (Dep on two fractions with different algebraic denominators)
	Completion to $3x^2 - 98x + 240 [= 0]$ with no errors	A1	

Question	Answer	Marks	Partial Marks
(c)(iii)	$30, \frac{8}{3}$ oe	2	M1 for suitable sketch of parabola with 2 positive solutions or $(3x-8)(x-30) = 0$ or $\frac{-(-98) \pm \sqrt{(-98)^2 - 4(3)(240)}}{2 \times 3}$
(c)(iv)	20	2	M1 for $\frac{480}{\text{their}30-6}$

02. 0607_m24_ms_42 Q: 11

Question	Answer	Marks	Partial Marks
(a)	$x < 2.5$ oe final answer	2	M1 for $2 + 8 > 7x - 3x$ oe or B1 for $x * 2.5$ where * is =, >, ≤ or ≥
(b)	$3(5x + 1)(5x - 1)$ final answer	2	B1 for $3(25x^2 - 1)$ or $(15x + 3)(5x - 1)$ or $(15x - 3)(5x + 1)$
(c)(i)	$\frac{19}{30x}$ cao final answer	2	B1 for any equivalent or M1 for correct use of common denominator e.g. $\frac{20+5-6}{30x}$, $\frac{20x+5x-6x}{30x^2}$ etc. oe
(c)(ii)	$\frac{x-b}{x-5}$ final answer	4	B3 for $(x-b)(2x+3)$ and $(x-5)(2x+3)$ or B2 for $(x-b)(2x+3)$ or for $(x-5)(2x+3)$ or B1 for $x(2x+3) - b(2x+3)$ or $2x(x-b) + 3(x-b)$ or $x(2x+3) - 5(2x+3)$ or $2x(x-5) + 3(x-5)$ or $(2x+c)(x+d)$ where $c + 2d = -7$ or $cd = -15$

03. 0607_s24_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	-4	2	M1 for $3x = -14 + 2$ or $x - \frac{2}{3} = \frac{-14}{3}$
(a)(ii)	1.5 or $\frac{15}{10}$ oe	2	M1 for $7x + 3x = 26 - 11$ oe or better
(b)	Correctly equating coefficients or sketch of one equation with negative slope and y intercept	M1	If 0 scored, SC1 for answers that satisfy one equation. SC1 for two correct answers with no working
	Correct method to eliminate one variable or sketch of other equation with negative slope and y intercept	M1	
	$x = -1.5$ oe	A1	
	$y = -2.5$ oe	A1	
(c)	$x > 4$ and $x < -5$ Mark final answer	4	M2 for correct sketch showing both answers or M1 for appropriate sketch of $y = 2x + 1 $ OR M2 for $2x + 1 > 9$ oe and $2x + 1 < -9$ oe or M1 for either correct inequality or for $2x + 1 = 9$ and $2x + 1 = -9$ oe B1 for $x > 4$ or $x < -5$ Mark final answer

04. 0607_s24_ms_41 Q: 10

Question	Answer	Marks	Partial Marks
(a)(i)	12	3	M1 for $y = \frac{k}{\sqrt{x+1}}$ oe A1 for $k = 36$ OR M2 for $18 \div \sqrt{\frac{8+1}{3+1}}$ oe or M1 for $\frac{y}{18} = \sqrt{\frac{3+1}{8+1}}$ oe
(a)(ii)	575	2	M1 for $\sqrt{x+1} = \frac{\text{their } k}{1.5}$ or better
(b)	18 NFWW	3	M1 for $18 = c \times \sqrt{3+1}$ oe or better M1 for $wy = \text{their } 9\sqrt{x+1} \times \frac{\text{their } 36}{\sqrt{x+1}}$ oe

05. 0607_s24_ms_42 Q: 7

Question	Answer	Marks	Partial Marks
(a)	$-\frac{39}{16}$ oe or -2.44	3	B1 for $[63 =] 24 - 16a$ M1 for <i>their</i> $16a = \text{their } 24 - 63$ oe or better
(b)	Correctly equating coefficients	M1	Allow 1 arithmetic slip
	Correct method to eliminate one variable	M1	Allow 1 further arithmetic slip
	$[p =] \frac{1}{2}$ oe $[q =] -\frac{1}{4}$ oe	B1	If 0 scored, SC1 for answers that satisfy one equation
(c)(i)	$(c+7)(c-8)$ oe	2	B1 for $(c+a)(c+b)$ where $ab = -56$ or $a+b = -1$ or $c(c+7) - 8(c+7)$ or $c(c-8) + 7(c-8)$
(c)(ii)	$-7, 8$	1	FT <i>their</i> (i)

06. 0607_s24_ms_42 Q: 11

Question	Answer	Marks	Partial Marks
(a)	$\frac{3x+2y}{3x}$ or $1 + \frac{2y}{3x}$ final answer	3	B1 for $(3x+2y)(3x-2y)$ isw B1 for $3x(3x-2y)$ isw

Question	Answer	Marks	Partial Marks
(b)(i)	$5(4-x) - 7(2x-3) = 2(2x-3)(4-x)$ or better	M1	Correctly clearing fractions
	$[(2x-3)(4-x)] = 8x - 12 - 2x^2 + 3x$ or $2[(2x-3)(4-x)] = 16x - 24 - 4x^2 + 6x$	B1	
	Leading to $4x^2 - 41x + 65 = 0$ with no errors or omissions	A1	
(b)(ii)	$\frac{-(-41) \pm \sqrt{(-41)^2 - 4 \times 4 \times 65}}{2 \times 4}$ or sketch with both answers indicated	M2	M1 for $\sqrt{(-41)^2 - 4 \times 4 \times 65}$ or $\frac{-(-41) + \text{or } -\sqrt{p}}{2 \times 4}$ or suitable sketch which would lead to answers
	$1.96, 8.29$ cao	B2	B1 for each or for 1.960... and 8.289 to 8.290

Question	Answer	Marks	Partial Marks
(a)(i)	$-\frac{2}{7}$	2	M1 for $2x + 5x = 1 - 3$ or better
(a)(ii)	-5 -1	2	B1 for each or M1 for $x + 3 = \pm 2$
(b)	$3x^2y^2(2x - y)$ Final answer	2	B1 for correctly extracting 2 or more factors
(c)	$\frac{x-31}{(2x+3)(x-5)}$ or $\frac{x-31}{2x^2-7x-15}$ Final answer	3	B1 for $5(x-5) - 2(2x+3)$ oe ISW B1 for denominator $(2x+3)(x-5)$ oe

Question	Answer	Marks	Partial Marks
(d)	$\frac{-3 \pm \sqrt{3^2 - 4 \times 2 \times -7}}{2 \times 2}$ or suitable sketch(es) with both answers indicated	M2	M1 for $\sqrt{3^2 - 4 \times 2 \times -7}$ or M1 for $\frac{-3 + \sqrt{p}}{2 \times 2}$ or $\frac{-3 - \sqrt{p}}{2 \times 2}$ Denominator must be shown as 2×2 to earn the second M1 but a denominator of 4 is condoned for M2
	1.27 and -2.77 cao	B1	

08. 0607_m23_ms_42 Q: 5

Question	Answer	Marks	Partial Marks
(a)	7.2 oe	2	M1 for $48 = 3 \times 4 + 5B$
(b)	0.5 oe	3	M1 for $6 - 12x$ or $2 + 4x - 4$ M1 for correctly collecting <i>their</i> terms e.g. $-12x - 4x = 2 - 4 - 6$ oe
(c)	-8.5 oe	3	M1 for eliminating fractions M1 for expanding brackets and collecting <i>their</i> terms M1 for correctly solving <i>their</i> equation of the form $ax = b$ Max 2 marks for incorrect answer
(d)	0.8 oe	4	B1 for $2 = 2\log 10$ or $\log 100$ M1 for a correct use of $\log a + \log b = \log ab$ or $\log a - \log b = \log \frac{a}{b}$ M1 for a correct use of $\log a^b = b \log a$
(e)	$x = -1.72$ $x = 1.55$	3	M2 for sketch indicating correct roots or $x = \frac{-1 \pm \sqrt{1^2 - 4 \times 6 \times (-16)}}{2 \times 6}$ or M1 for $6x^2 + x - 16 = 0$ or reverse signs If 0 scored, SC1 for one correct answer

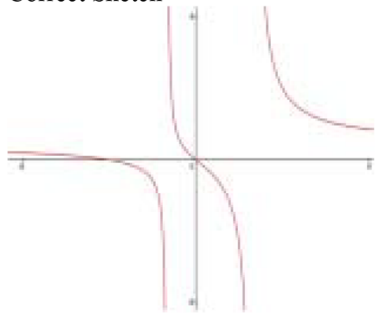
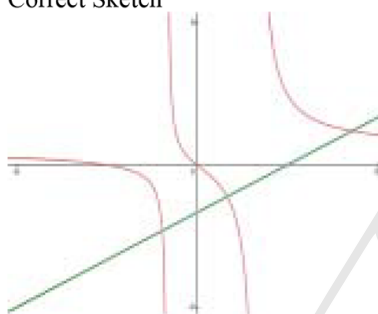
09. 0607_m23_ms_42 Q: 7

Question	Answer	Marks	Partial Marks
(a)	$y = \frac{20}{\sqrt[3]{x}}$	3	M1 for $y = \frac{k}{\sqrt[3]{x}}$ B1 for $k = 10 \times \sqrt[3]{8}$
(b)	15.625 oe	2	M1 for $\sqrt[3]{x} = \frac{\text{their } 20}{8}$ or M1 for $10 \times \sqrt[3]{8} = 8 \times \sqrt[3]{x}$ oe
(c)	$w = 800x^{\frac{-2}{3}}$ cao	4	B2 for $w = 2y^2$ or B1 for $w = ky^2$ and M1 for $w = \text{their } k \left(\text{their } \left(\frac{20}{\sqrt[3]{x}} \right) \right)^2$

Question	Answer	Marks	Partial Marks
(a)	$2t + c = 1470$	B1	
	$3t + 2c = 2480$	B1	
	Correctly eliminating one variable	M1	
	460	B1	
(b)(i)	$\frac{969}{x} = \frac{969}{x+6} + 2$ oe	M1	
	$969(x+6) = 969x + 2x(x+6)$ oe	M1	dep fractions cleared from equation with two algebraic fractions with linear denominators
	Leading to $x^2 + 6x - 2907 [= 0]$	A1	With at least one step and no errors or omissions
(b)(ii)	-57 and 51	B2	M1 for $(x + 57)(x - 51)$ or $\frac{-6 \pm \sqrt{(-6)^2 - 4(1)(-2907)}}{2 \times 1}$ or sketch of parabola (+ve x^2) with one positive x intercept and one negative
(b)(iii)	19	B1	FT $\frac{969}{\text{their } 51}$ FT only if <i>their</i> 51 and answer are positive integers

11. 0607_s23_ms_42 Q: 1

Question	Answer	Marks	Partial Marks
(a)	2	1	
	$20 - 3n$ oe final answer	2	M1 for $k - 3n$ or for correct answer seen but then spoiled
(b)	$\frac{6}{7}$	1	
	$\frac{n}{n+1}$ oe final answer	1	
(c)	128	1	
	2^{n+1} oe final answer	2	M1 for 2^{n+k} oe
(d)	213	1	
	$n^3 - 3$ oe final answer	2	B1 for any cubic seen or M1 for third differences = 6 or for correct answer seen but then spoiled

Question	Answer	Marks	Partial Marks
(a)	Correct Sketch 	3	B1 for each branch correct
(b)	$x = 2, x = -1$	2	B1 for each
(c)	$-3, 0$	2	B1 for each
(d)(i)	Correct Sketch 	1	
(d)(ii)	-1.16 or $-1.162\dots$ 1 5.16 or $5.162\dots$	3	B1 for each
(d)(iii)	$-1.16 < x < -1$ $1 < x < 2$ $x > 5.16$	3	B1FT from <i>their (d)(ii)</i> and <i>their (b)</i> for each. FT dep on answers to (d)(ii) that lead to three equivalent inequalities Same accuracy as (d)(ii)

13. 0607_s23_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)	$7x - 11y$ Final answer	2	B1 for $7x - ky$ or $kx - 11y$ k not zero
(b)	$x^2 + 2x$ Final answer	1	
(c)	$(5b + 4c)(2a - 3b)$ Final answer	2	M1 for $2a(5b + 4c) - 3b(5b + 4c)$ or $5b(2a - 3b) + 4c(2a - 3b)$ or correct answer seen but spoiled
(d)(i)	$2(x - 3) - 5(2x + 1) = 3(2x + 1)(x - 3)$ oe or better	M1	
	$2x - 6 - 10x - 5$ or better	B1	
	$[3](2x^2 - 6x + x - 3)$ oe or better	B1	
	completion to $6x^2 - 7x + 2 [= 0]$	A1	at least one step with no errors or omissions
(d)(ii)	$(2x - 1)(3x - 2) [= 0]$ or sketch of parabola showing two positive solutions or $\frac{-(-7) \pm \sqrt{(-7)^2 - 4(6)(2)}}{2 \times 6}$	M2	M1 for pair of brackets giving two terms correct or sketch of any parabola for +ve x^2 or correct formula with $\frac{-(-7)}{2 \times 6}$ $\sqrt{(-7)^2 - 4(6)(2)}$ seen
	$\frac{1}{2}, \frac{2}{3}$ oe	B1	

14. 0607_s23_ms_43 Q: 6

Question	Answer	Marks	Partial Marks
(a)	4.5 oe	2	B1 for $7x - 3x = 13 + 5$ oe

Paper Perfection, Crafted With Passion

Question	Answer	Marks	Partial Marks
(b)	$\frac{15}{14}$ oe	3	B1 for $8x - 12 = 3 - 6x$ oe M1 for correctly collecting terms in an equation
(c)	$\frac{2}{3}, -2$ oe	3	B2 for $3x + 2 = \pm 4$ oe or for $[3](3x - 2)(x + 2)[= 0]$ oe or for $\frac{-4 \pm \sqrt{4(3)(-4)}}{2(3)}$ oe or M1 for $(3x + 2)^2 = 8 \times 2$ oe
(d)	0.35 – 2.85	3	B2 for –2.851 to –2.850 and 0.350 to 0.351 OR M2 for correct sketch indicating both roots or for $\frac{-5 \pm \sqrt{5^2 - 4(2)(-2)}}{2(2)}$ or M1 for $2x^2 + 5x - 2 [= 0]$ or $-2x^2 - 5x + 2 [= 0]$
(e)	$[x =] 10y^4$	3	M1 for $\log y^4$ B1 for $1 = \log 10$
(f)	$\frac{1}{4}$ oe	4	B3 for $n = 3$ or M2 for $2\frac{n}{12} = \frac{n+6}{18}$ or for $12p = 36p - 6$ oe or M1 for $p = \frac{n}{12}$ or $2p = \frac{n+6}{18}$ or for $\frac{n}{12}$ and $\frac{n+6}{18}$ seen

15. 0607_s23_ms_43 Q: 8

Question	Answer	Marks	Partial Marks
(a)	Correct method to eliminate one variable	M1	
	$[x =] 1$ $[y =] - 2$	A2	If 0 scored, SC1 for answers that satisfy one equation
(b)(i)	-5	1	
(b)(ii)	$9x + 4$ final answer	2	M1 for $3(3x+1)+1$ oe
(b)(iii)	1	3	M2 for $2(3x+1)-3=5$ oe or M1 for $\frac{1}{2(3x+1)-3} = \frac{1}{5}$ oe OR M2 for $f(x) = 4$ oe or M1 for $\frac{1}{2f(x)-3} = \frac{1}{5}$

16. 0607_w23_ms_41 Q: 10

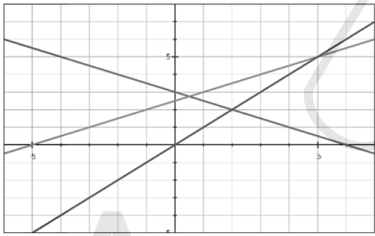
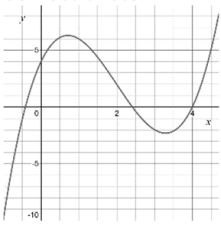
Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{kt}{6p}$ final answer	1	
(a)(ii)	$\frac{5u}{21}$ final answer	2	M1 for correct use of common denominator $\frac{3uk}{21k} + \frac{2uk}{21k}$
(b)	$\frac{x+6}{2(x+7)}$ or $\frac{x+6}{2x+14}$ final answer	4	B2 for $(x+6)(x-7)$ or B1 for $(x+a)(x+b)$ with $ab = -42$ or $a+b = -1$ or for $x(x+6) - 7(x+6)$ or $x(x-7) + 6(x-7)$ B1 for $2(x+7)(x-7)$ or $(2x+14)(x-7)$ or $(2x-14)(x+7)$
(c)	$\frac{-2g^2 + 23g + 15}{5(g+1)}$ final answer	3	B1 for $5(g-1) - 2g(g+1) + 5 \times 4(g+1)$ oe or better B1 for common denominator seen $5(g+1)$ or $5g+5$

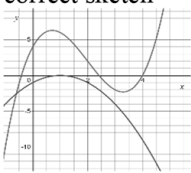
17. 0607_w23_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)	$[y =] \frac{36}{(x+1)^2}$	2	M1 for $\frac{k}{(x+1)^2}$
(b)	2.25 oe	2	M1 for $\frac{their36}{(3+1)^2}$ or better

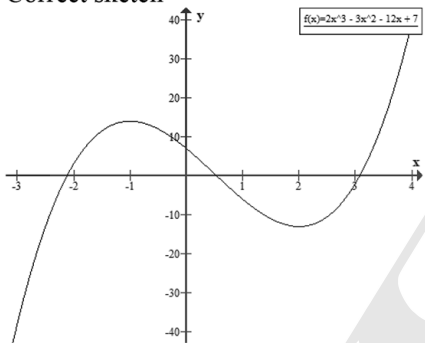
Question	Answer	Marks	Partial Marks
(c)	2.3[0...]	3	<p>M2 for $x+1 = \sqrt[3]{their36}$ or M1 for $x+1 = \frac{their36}{(x+1)^2}$</p> <p>M1 for sketch of a cubic crossing x axis once with a positive x intercept</p>

18. 0607_w23_ms_42 Q: 5

Question	Answer	Marks	Partial Marks
(a)(i)	correct sketch 	4	<p>B1 for correct sketch of $2y = x + 5$ B1 for correct sketch of $y = -\frac{1}{2}x + 3$ B1 for correct sketch of $y = x$ passing through (0,0) B1 for all intersections in 1st quadrant</p>
(a)(ii)	correct region indicated	2	<p>FT their lines B1 for region satisfying 2 inequalities or for shading shown but region not clearly indicated</p>
(b)(i)	correct sketch 	2	M1 for positive cubic curve with a maximum and minimum
(b)(ii)	(0.709, 6.3[0])	2	B1 for one correct coordinate
(b)(iii)	-2.3[0], <i>their</i> 6.3[0]	2	B1 for each

Question	Answer	Marks	Partial Marks
b(iv)	correct sketch 	2	M1 for negative quadratic curve
b(v)	-0.599 or -0.5987 to -0.5986	1	

19. 0607_w23_ms_43 Q: 4

Question	Answer	Marks	Partial Marks
(a)	Correct sketch 	2	B1 for any cubic with positive x^3

Question	Answer	Marks	Partial Marks
(b)	-2.12 or -2.116... 0.537 or 0.5370... 3.08 or 3.079...	3	B1 for each
(c)	14 and -13 cao	2	B1 for each or B1 for both 14 and -13 seen
(d)	$-1 < x < 2$	2	B1 for each

20. 0607_w23_ms_43 Q: 8

Question	Answer	Marks	Partial Marks
(a)	-36	2	M1 for $60 + (-32) \times 3$ oe or B1 for 96 seen
(b)(i)	0.7 oe	2	M1 for $6x + 4x = 9 - 2$ or better
(b)(ii)	5 and -2 nfw	3	B2 for -2 nfw B1 for 5 or M1 for $2x - 3 = -7$ or $2x - 3 = \pm 7$ or M1 for a correct diagram
(c)	$(3x - 2)(x - 3)$	M1	
	$[x =]\frac{2}{3}$ oe , 3	B1	

Question	Answer	Marks	Partial Marks
(d)	$\frac{3b}{5y - a}$ oe final answer	3	M1 for $5xy = ax + 3b$ M1FT for $5xy - ax = 3b$ M1FT for factorising and division Incorrect answers score M2 maximum.
(e)	$\frac{a - 2b}{x - 3y}$ oe final answer	4	B2 for $(x + 3y)(a - 2b)$ or B1 for $x(a - 2b) + 3y(a - 2b)$ oe B1 for $(x + 3y)(x - 3y)$

21. 0607_s15_ms_42 Q: 7

Qu.	Answer	Mark	Part Marks
(a)	$x = -1$ ruled	1	B1 for line with gradient 2 or y-intercept -3
	$y = 2$ ruled	1	
	$y = 2x - 3$ ruled	2	
	$3x + 5y = 30$ ruled	2	B1 for line with negative gradient through (0, 6) or through (10, 0)
	Correct region clearly indicated cao	1	
(b) (i)	6.5 to 6.7 cao	1	
(b) (ii)	7.2 to 7.6 cao	1	

22. 0607_w19_ms_41 Q: 9

Question	Answer	Marks	Partial Marks
(a)	6.77 or 6.765 to 6.766	2	M1 for $10.6 \div 94$ or $94 \div 60$
(b)	3.33 or 3.333... or $3\frac{1}{3}$	3	M2 for $\frac{2+3}{\frac{2}{4}+\frac{3}{3}}$ or M1 for $\frac{2}{4}$ oe or $\frac{3}{3}$ oe
(c)	$\frac{18v}{5}$ or $3.6v$ or $3\frac{3}{5}v$	2	M1 for $\times (60 \times 60)$ oe or for $\div 1000$
(d)(i)	$\frac{130x+500}{x(x+10)}$ or $\frac{130x+500}{x^2+10x}$	3	M1 for $\frac{50}{x} + \frac{80}{x+10}$ B1 for common denominator $x(x+10)$ oe

Question	Answer	Marks	Partial Marks
(d)(ii)	$130x+500=2x(x+10)$ oe	M1	i.e. fraction with linear numerator and quadratic denominator removed correctly
	$130x+500=2x^2+20x$ leading to $x^2-55x-250=0$	A1	i.e. equation with four terms no errors or omissions
(d)(iii)	59.2 or 59.22... only	3	M2 for correct graph of quadratic showing positive root or for $\frac{-(-55) \pm \sqrt{(-55)^2 - 4(1)(-250)}}{2(1)}$ oe or M1 for appropriate quadratic graph or for $\sqrt{(-55)^2 - 4(1)(-250)}$ oe or for $\frac{-(-55)}{2(1)}$ oe in correct formula

23. 0607_s16_ms_41 Q: 2

Question	Answer	Mark	Part Marks
(a)	$\frac{300}{L}$ oe	3	M1 for $f = \frac{k}{L}$ soi oe M1 (Dep on 1 st M1) for substituting $f = 93.7$ and $L = 3.2$ soi by 299.8 or 299.84
(b)	107 or 107.0 to 107.1 ...	1FT	FT $\frac{\text{their } k}{L}$ oe only
(c)	857 or 856.5 to 857.1 ...	2FT	FT $\frac{\text{their } k}{L}$ oe only M1 for $0.35 = \frac{\text{their } k}{L}$

24. 0607_s16_ms_43 Q: 3

Question	Answer	Mark	Part Marks
(a)	62.5	3	B1 for $y = k(x+1)^3$ B1 for $k = 0.5$ OR M2 for $\frac{y}{32} = \frac{(4+1)^3}{(3+1)^3}$
(b)	2	2	B1FT for $x+1 = \sqrt[3]{\text{their } 27}$
(c)	$x = \sqrt[3]{2y} - 1$ oe final answer	3	M1 for division by <i>their k</i> M1 for cube root M1 for subtracting 1, must be final step

25. 0607_s15_ms_41 Q: 14

Qu.	Answer	Mark	Part Marks
(a)	$\frac{1}{6}pq$ oe final answer	1	
(b)	$\frac{2}{3}p + \frac{1}{4} \times \frac{1}{3}p$ oe	M2	M1 for $\frac{1}{4} \times \frac{2}{3}p$ or for $\frac{3}{4} \times \frac{1}{3}p$
(c)	$\frac{21}{32}pq$ final answer	2	M1 for $\frac{3}{4}q \times \frac{3}{4}p + \frac{1}{2} \times \frac{1}{4}p \times \frac{3}{4}q$ oe
(d)	17 : 63 cao	2	isw attempt to change form of 17 : 63 to e.g. 1 : $\frac{17}{63}$ M1 for pq – <i>their (a)</i> – <i>their (c)</i> oe soi by any equivalent ratio

26. 0607_w19_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	-4	2	M1 for $2x = -11 + 3$ or $x - \frac{3}{2} = \frac{11}{2}$ oe
(a)(ii)	-9	2	M1 for $36 = -4x$ or $\frac{36}{-4} = x$ oe
(a)(iii)	0.5 oe	2	M1 for $6x + 2x = 17 - 13$ oe
(b)	Correctly equating one set of coefficients OR $x = \dots$ or $y = \dots$ from one equation	M1	Allow correct sketches, i.e. two lines with negative gradients
	Correct method for eliminating one variable OR correct substitution into other equation	M1	
	$[x =] -2$ $[y =] -3$	B2	B1 for each If 0 scored, SC1 for correct substitution in one of the original equations to find other variable

27. 0607_s17_ms_42 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	$[x =] cv$ oe	1	
(a)(ii)	$[y =] kv^2$ oe	1	
(a)(iii)	$[d =] cv + kv^2$ or $v(c + kv)$ oe	1	FT
(b)(i)	$750 = 12c + 12^2 k$ oe	M1	isw any cancelling
(b)(ii)	$2050 = 20c + 20^2 k$ oe	1	isw any cancelling
(c)	$[c =] 2.5$ oe cao $[k =] 5$ cao	3	M1 for correctly eliminating one variable from <i>their</i> equations in this part. or sketches of lines A1 for either solution If zero scored SC1 for <i>their</i> values satisfying one equation.
(d)	8100	2	M1 for correct substitution of 40 into <i>their</i> (a)(iii) containing <i>their</i> values of c and k .

28. 0607_w17_ms_43 Q: 11

Question	Answer	Marks	Partial Marks
(a)	$[x =] 5$ $[y =] 2$ with correct working	4	M1 for correctly equating one set of coefficients M1 for correct method to eliminate one variable OR M1 for equation $x =$ or $y =$ from one equation M1 for correct substitution into other equation B1 for $x = 5$ B1 for $y = 2$ If zero scored SC1 for correct subst into one of original equs and evaluation to find other variable
(b)	$[a =] 10$ $[b =] 4$	2	B1 for each FT <i>their</i> $(a) \times 2$

Question	Answer	Marks	Partial Marks
10(c)(i)	$[p =] \log 5$ and $[q =] \log 2$ Final answers	3	B2 FT <i>their</i> (a) for either seen or B1 FT for each correct decimal answer 0.699 or 0.6989 to 0.6990 0.301 or 0.3010... or M1 for $10^p = \textit{their} 5$ or $10^q = \textit{their} 2$
10(c)(ii)	1 cao	1	

29. 0607_w16_ms_42 Q: 7

Question	Answer	Mark	Part Marks
	Correctly equating one set of coefficients	M1	Equation $x =$ or $y =$ from one equation
	Correct method to eliminate one variable	M1	Correct substitution into other equation
	$x = -2$ $y = -\frac{1}{2}$	B2	B1 for each If zero scored SC1 for correct substitution into one of original equations and evaluation to find other variable

30. 0607_s15_ms_41 Q: 2

Qu.	Answer	Mark	Part Marks
	Correctly equating one set of coefficients Correct method to eliminate one variable $x = 1.5$ $y = -2$	M1 M1 B1 B1	or making x or y the subject of one equation or substituting into other equation or sketch of their two lines If 0 scored, SC1 for correct substitution into one of original equations to find other variable

31. 0607_s20_ms_41 Q: 5

Question	Answer	Marks	Partial Marks
(a)(i)	$1 - 11p$ final answer	2	B1 for $1 + kp$ or for $k - 11p$
(a)(ii)	$21g^2 + 71gh - 22h^2$ final answer	3	B2 for 3 from $21g^2, 77gh, -6gh, -22h^2$ or B1 for 2 from $21g^2, 77gh, -6gh, -22h^2$
(b)(i)	$2x^2y^2(y - 2x)$ final answer	2	B1 for any correct partially factorised expression
(b)(ii)	$(7t + 3u)(7t - 3u)$ final answer	2	B1 for $(at + b)(ct + d)$ with two of $ac = 49, bc + ad = 0, bd = -9$ correct or for $(7t + 3)(7t - 3)$ or $(7 + 3u)(7 - 3u)$
(b)(iii)	$(2d - 1)(3d + 2)$ final answer	2	B1 for $(pd + q)(rd + s)$ with two of $pr = 6, ps + qr = 1, qs = -2$ correct or for $2d(3d + 2) - (3d + 2)$ or $3d(2d - 1) + 2(2d - 1)$

32. 0607_w16_ms_41 Q: 10

Qu.	Answer	Mark	Part Marks
(a)	$\frac{9}{7}$ oe	2	M1 for $7x = 11 - 2$ oe
(b)	$\frac{5x+1}{6}$ final answer	2	M1 for $3(x+1) + 2(x-1)$ seen
(c) (i)	$\frac{2x}{y^2}$ final answer	2	B1 for 2 terms correct
(ii)	$\frac{x+3}{x+1}$ final answer	4	B1 for $(x-3)(x+3)$ B2 for $(x-3)(x+1)$ or or SC1 for $(x+a)(x+b)$ where $ab = -3$ or $a+b = -2$

33. 0607_w15_ms_41 Q: 11

Question	Answer	Mark	Part Marks
(a)	2.79 cao nfww 6	6	B1 for $2x + y = 157$ oe B1 for $x + 3y = 296$ oe M1 for eliminating one variable or appropriate sketch B1 for $[x =] 35$ oe B1 for $[y =] 87$ oe or M1 for x and y working in one equation
(b)	3 nfww 4	4	M2 for $\frac{24}{x} + \frac{24}{x+5} = 11$ oe or B1 for $\frac{24}{x}$ or $\frac{24}{x+5}$ M1 for full method e.g. sketch of graph showing solution or quadratic with correct factors or $\frac{-7 \pm \sqrt{7^2 - 4(1)(-120)}}{2 \times 11}$ Note that $x + x + 5 = 11$ is wrong working

34. 0607_w15_ms_42 Q: 14

Question	Answer	Mark	Part Marks
(a)	$\frac{x-3}{x}$	1	
(b)	$\frac{x}{x+3}$	1FT	
(c) (i)	All correct with no errors $\frac{x}{x+3} - \frac{x-3}{x} = \frac{9}{40}$ $\frac{x^2 - (x-3)(x+3)}{x(x+3)} \left[= \frac{9}{40} \right]$ oe or better $360 = 9x^2 + 27x$ oe $x^2 + 3x - 40 = 0$	M1 M1 A1	<i>their Q – their P</i> i.e. at least one more correct line and no errors or omissions
(ii)	-8	1	
	5	1	
(iii)	$\frac{2}{5}$	1	Allow final answer $\frac{-11}{-8}$ but not $\frac{11}{8}$

35. 0607_m22_ms_42 Q: 6

Question	Answer	Marks	Partial Marks
(a)	$(5x+1)(2x-1) - 7(13-x) = 84$ oe	M1	Correct first statement without brackets expanded
	$10x^2 - 5x + 2x - 1$	B1	
	$-91 + 7x$	B1	on LHS or $91 - 7x$ on RHS
	$10x^2 + 4x - 176 = 0$ oe leading to $5x^2 + 2x - 88 = 0$ with no errors or omissions	A1	
(b)	$(5x+22)(x-4)$	2	B1 for $(5x+a)(x+b)$ with $ab = -88$ or $a + 5b = 2$ or for $5x(x-4) + 22(x-4)$ or for $x(5x+22) - 4(5x+52)$
(c)	63	2	M1 for solving <i>their</i> factorised quadratic, allowing omission of negative root. FT $(13 - \text{their positive root}) \times 7$ if $\frac{1}{2} < x < 13$

Question	Answer	Marks	Partial Marks
(a)	$\frac{200}{x}$	1	
(b)	$\frac{200}{x} + \frac{50}{x-40} = \frac{7}{2}$ oe	M1	
	$400(x-40) + 100x = 7x(x-40)$ oe	M2	FT only an equation of the correct form with equivalent difficulty M1FT for $\frac{200(x-40) + 50x}{x(x-40)}$ or better
	Completion to $7x^2 - 780x + 16000 = 0$ with no errors or omissions	A1	With at least one intermediate step
(c)	2 [h] 22 [min]	5	B4 for 2.37 or 2.371 to 2.372 or 2h 22 to 22.3... min or 142 to 142.3... or B3 for 27.1 or 27.10 to 27.11 and 84.3 or 84.3... , or M2 for $\frac{-(-780) \pm \sqrt{(-780)^2 - 4 \times 7 \times 16000}}{2 \times 7}$ or sketch of parabola (positive x^2) with two positive zeros or M1 for $\sqrt{(-780)^2 - 4 \times 7 \times 16000}$ or $\frac{-(-780) \pm \sqrt{p}}{2 \times 7}$ and M1 for $200 \div$ their solution from their quadratic if > 40

37. 0607_w21_ms_41 Q: 9

Question	Answer	Marks	Partial Marks
(a)	$x^2 + (3x + 1)^2 = 16$	M1	
	$9x^2 + 3x + 3x + 1$ or $9x^2 + 6x + 1$	B1	
	Completion to $10x^2 + 6x - 15 = 0$ with no errors	A1	
(b)	$\frac{-6 \pm \sqrt{(6)^2 - 4(10)(-15)}}{2 \times 10}$ or sketch of parabola (+ve x^2) with x intercepts opposite sign	M2	M1 for $\frac{-6 \pm \sqrt{D}}{2 \times 10}$ or $\frac{p \pm \sqrt{(6)^2 - 4(10)(-15)}}{q}$ or sketch of any U shaped parabola
	$(-1.56, -3.68)$ $(0.96, 3.88)$	A2	A marks depend on M2 A1 for both x -values correct or one coordinate pair correct or both y -values correct FT <i>their x</i> If M0 scored, SC1 for correct answers with wrong or no working.

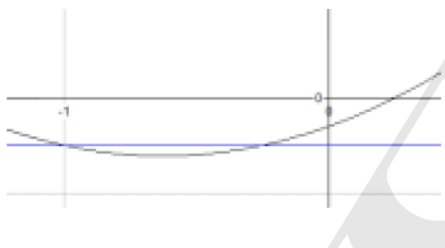
38. 0607_w21_ms_42 Q: 7

Question	Answer	Marks	Partial Marks
(a)	$[p =] [0].85$ $[m =] 2.15$	5	B1 for $3p + 5m = 13.30$ B1 for $p + 7m = 15.90$ M1 for correctly eliminating one variable from <i>their</i> equations in terms of p and m or correct sketch B1 for $p = [0].85$ B1 for $m = 2.15$ If M0 scored then SC1 for values satisfying one of <i>their</i> equations

Question	Answer	Marks	Partial Marks
(b)	1.43 or 1.434... only	7	<p>B6 for 1.43 or 1.434... and 0.232 or 0.2324...</p> <p>OR</p> <p>M1 for $(2x - 1)^2 = x(x + 1)$</p> <p>B1 for $4x^2 - 2x - 2x + 1$ oe</p> <p>B1 for $x^2 + x$</p> <p>M1 for correct three term quadratic from <i>their</i> areas</p> <p>M1 for $\frac{-(-5) \pm \sqrt{(-5)^2 - 4(3)(1)}}{2(3)}$ for <i>their</i> quadratic or sketch leading to roots of <i>their</i> quadratic</p>

39. 0607_w20_ms_41 Q: 3

Question	Answer	Marks	Partial Marks
(a)	Correctly equating one set of coefficients or correctly expressing one variable in terms of the other	M1	
	Correct method to eliminate one variable	M1	
	$[x =] -1$	A1	
	$[y =] -2$	A1	If 0 scored SC1 for correct substitution into one of original equations and evaluation to find other variable, or for 2 correct answers with no working

Question	Answer	Marks	Partial Marks
(b)	Algebraic method. $8x^2 + 12x - 2x - 3 [= -5]$	M1	Correct Expansion
	$8x^2 + 10x + 2 = 0$ or better	M1	Correctly equating <i>their</i> quadratic to zero
	$(4x + 1)(2x + 2) [= 0]$ oe $(8x + 2)(x + 1) [= 0]$	M1	or correct use of formula with <i>their</i> 3 term quadratic or correct sketch of parabola
	$[x =] -1$ and $[x =] -0.25$ oe	B2	A1 dep on 3rd M1 for either
	OR GDC method 	M3	M2 for parabola intersecting $y = -5$ twice or M1 for parabola OR M3 for correct graph of <i>their</i> rearranged equation
$[x =] -1$ and $[x =] -0.25$ oe	B2	A1 for either	

40. 0607_w20_ms_43 Q: 7

Question	Answer	Marks	Partial Marks
(a)(i)	$(a - b)(a + b)$	1	
(a)(ii)	12.25	5	B4 for $2a = 7$ or $2.6a = 9.1$ or better or B3 for $2b = 4.4$ or $2.6b = 5.72$ or better OR M1 for $a^2 - b^2 = 7.41$ oe M1 for $a - b = 1.3$ oe M1 for $a + b = 7.41 \div 1.3$ or for a or b correctly eliminated
(b)(i)	$(x - 8)(x + 3)$	2	B1 for $(x + a)(x + b)$ with $ab = -24$ or $a + b = -5$ or for $x(x + 3) - 8(x + 3)$ or for $x(x - 8) + 3(x - 8)$

Question	Answer	Marks	Partial Marks
(b)(ii)	204	8	<p>B7 for $x = 8$ isw $x = -3$</p> <p>OR</p> <p>M1 for $(x+1)(x+13)$ or for $(x+4)(2x+1)$</p> <p>B1 for $2x^2 + 8x + x + 4$</p> <p>B1 for $x^2 + x + 13x + 13$</p> <p>M1 for $(x+4)(2x+1) - (x+1)(x+13) = 15$ oe</p> <p>A1 for $x^2 - 5x - 24 = 0$ reached without any error or omission</p> <p>M1 for $(2 \times \text{their } x + 1)(\text{their } x + 4)$ evaluated correctly</p> <p>OR</p> <p>M6 for graph(s) which would lead to correct value of x.</p> <p>or M3 for appropriate graph(s) but not leading to value of x.</p> <p>or M1 for setting up input for graphics calculator</p>

41. 0607_s19_ms_41 Q: 9

Question	Answer	Marks	Partial Marks
(a)	$(45 + 4x)(20 + 2x) = 2208$	M1	
	$900 + 90x + 80x + 8x^2$	B1	For expansion
	Completion to $4x^2 + 85x - 654 = 0$ with no errors or omissions	A1	
(b)	$\frac{-85 \pm \sqrt{85^2 - 4(4)(-654)}}{2 \times 4}$	M1	or $(x-6)(4x+109)$ or sketch of parabola ($+x^2$) with one positive zero and one negative
	6, -27.25 oe	B2	B1 for each
(c)	Length = 69 Height = 32	B2	B1FT for each

42. 0607_s19_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)	$3p + r = 67$ oe $2p + 3r = 96$ oe	B2	B1 for each Accept words in equations, using + and =.
	correctly eliminating one variable	M1	
	[pencil =] 15	B1	
	[ruler =] 22	B1	If M0 scored in addition to B0 (for answers) scored then award SC1 for answers satisfying one of <i>their</i> two original equations in 2 variables
(b)(i)	$\frac{1}{2}(x+1)x = \left(\frac{5x}{4} + 3\right)(x-4)$ oe	M2	M1 for $\frac{1}{2}(x+1)x$ or $\left(\frac{5x}{4} + 3\right)(x-4)$
	$\frac{5x^2}{4} - 5x + 3x - 12$ oe	B1	i.e. correct expansion for rectangle
	$3x^2 - 10x - 48 = 0$ reached with no errors or omissions including at least one line of working	A1	Dependent on B1
(b)(ii)	$(3x+8)(x-6)$	2	B1 for $3x(x-6) + 8(x-6)$ or $x(3x+8) - 6(3x+8)$ or $(3x+a)(x+b)$ with $ab = -48$ or $a + 3b = -10$
(b)(iii)	21	2	FT $\frac{1}{2} \times (\text{their positive } x) \times (\text{their positive } x + 1)$ if $x > 4$ M1 $\frac{1}{2} \times (\text{their positive } x) \times (\text{their positive } x + 1)$ if $x > 4$

43. 0607_w19_ms_42 Q: 7

Question	Answer	Marks	Partial Marks
(a)(i)	$(2x+1)(x-6)$ final answer	2	M1 for $(2x+a)(x+b)$ where $ab = -6$ or $a+2b = -11$ or $2x(x-6)+x-6$ or $x(2x+1)-6(2x+1)$ or correct answer seen
(a)(ii)	$-0.5 < x < 6$	2	FT <i>their</i> (i) only from factors giving positive x^2 term B1 for each or -0.5 and 6 seen
(b)	Appropriate sketch indicating answers (one positive and one negative) or correct substitution in formula or correct completion of square	M1	Allow $\sqrt{61}$ for $\sqrt{(-1)^2 - 4(3)(-5)}$
	1.47 -1.14	B2	B1 for each or both correct but not rounded to 2dp 1.468..., -1.135...

44. 0607_w19_ms_43 Q: 10

Question	Answer	Marks	Partial Marks
(a)	$\frac{840}{2x+3}$	1	
(b)	$2(2x+3)+2$ <i>their</i> $\times \frac{840}{2x+3} = 118$ oe	M1	
	$2(2x+3)^2 + 1680 = 118(2x+3)$ oe	M1	Clearing fractions
	Correct completion to $2x^2 - 53x + 336 = 0$	A1	No errors or omissions
(c)	$(2x-21)(x-16) = 0$	M1	or $x = \frac{-(-53) \pm \sqrt{(-53)^2 - 4(2)(336)}}{2 \times 2}$ or sketch of parabola (+ve x^2 , +ve zeros)
	10.5, 16	B2	B1 for each
(d)	35 24	2	B1 for each If 0 scored, SC1 for a pair of values with a product of 840 or a sum of 59

45. 0607_s18_ms_43 Q: 10

Question	Answer	Marks	Partial Marks
(a)	$\frac{930}{x}$	1	
(b)(i)	$\frac{930}{x} - \frac{930}{x+5}$ soi	M1	
	$1860(x+5) - 1860x = x(x+5)$ oe	M1	FT dep on 1st M1 with $\frac{1}{2}$ as separate term in equation
	Completion to $x^2 + 5x - 9300 = 0$ with no errors	A1	
(b)(ii)	94[.0] or 93.96 to 93.97 -99[.0] or -98.97 to -98.96	3	M1 for $\frac{5 \pm \sqrt{5^2 - 4(1)(-9300)}}{2}$ or sketch of parabola B1 for 1 correct
(b)(iii)	9 [h] 24 or 23 to 24 [min]	2	M1 for $930 \div (\text{their } 94 + 5)$ oe If 0 scored SC1 for 9 h 53min to 9 h 54 min

46. 0607_w18_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	8	1	
(a)(ii)	4	2	M1 for correct 1st step
(a)(iii)	3	2	M1 for correct 1st step
(b)(i)	$[x =] \frac{1}{2}, \frac{1}{3}$	3	<p>M2 for $(3x-1)(2x-1) [= 0]$ or M1 for $(ax \pm 1)(bx \pm 1)$ where $ab = 6$ or $a + b = -5$ or $3x(2x-1) - 1(2x-1)$ or $2x(3x-1) - 1(3x-1)$</p> <p>OR</p> <p>M2 for correct sketch or M1 for any U-shaped parabola crossing x-axis twice</p> <p>OR</p> <p>M2 for $\frac{5 \pm \sqrt{(-5)^2 - 4 \times 6[\times 1]}}{2 \times 6}$ or M1 for $\frac{b}{2a}$ or $b^2 - 4ac$ correct</p>
(b)(ii)	30, 19.5 or 19.47...	3	<p>B2 FT for one correct answer</p> <p>M1 for $\sin x = \text{their} \left(\frac{1}{2} \right)$ or $\sin x = \text{their} \left(\frac{1}{3} \right)$</p>

47. 0607_s17_ms_41 Q: 11

Question	Answer	Marks	Partial Marks
(a)(i)	275	1	
(a)(ii)	2.5 oe	2	M1 for $275 \div 110$

Question	Answer	Marks	Partial Marks
(b)	09 00 oe	3	B2 for 1 h 42 mins or 102 mins soi or M1 for $170 \div 100$ oe If 0 scored, SC1 for correct conversion of <i>their</i> decimal time into hours and mins
(c)	24.6 or 24.63...	3	M2 for $\frac{215}{12.5} \times 1.432$ or M1 for $\frac{215}{12.5}$ or 215×1.432 or $\frac{1.432}{12.5}$ soi
(d)(i)	$\frac{325}{90+x} - \frac{110}{30+2x} = \frac{3}{2}$ oe	M2	or M1 for $\frac{325}{90+x}$ or $\frac{110}{30+2x}$
	$650(30+2x) - 220(90+x)$ $= 3(90+x)(30+2x)$ oe	M1	Dependent on first equation containing the three terms. Correctly eliminating fractions
	Correct completion to $x^2 - 75x + 1400$ with no errors or omissions	A2	B1 for $2700 + 180x + 30x + 2x^2$ soi
(d)(ii)	125 and 130	3	B2 for one or for 35 and 40 or B1 for 35 or 40 or M1 for $\frac{-(-75) \pm \sqrt{(-75)^2 - (4)(1)(1400)}}{2 \times 1}$ or sketch of parabola with two positive zeros or $(x-35)(x-40)$

48. 0607_w17_ms_43 Q: 10

Question	Answer	Marks	Partial Marks
(a)	appropriate sketch giving one positive and one negative answer or fully correct use of formula	M2	M1 for sketch of parabola or parabola and straight line or $\sqrt{3^2 - 4(4)(-12)}$ or $\frac{-3 \pm \sqrt{\dots}}{2(4)}$ oe
	1.4[0] and -2.15 final answers	B2	B1 for each If 0 scored B1 for 1.397... and -2.147... or SC1 for 2.15 and -1.4[0]
(b)	$x > 1.40$ and $x < -2.15$	2	FT $[x] > \text{their max}(a)$, $[x] < \text{their min}(a)$ B1 for each
(c)	$-1.75 \leq x \leq 1$ nfw	4	B3 for 1, -1.75 oe B2 for 1 inequality correct B1 for 1 correct value seen or M2 for appropriate sketch or correct factorising or correct use of formula or M1 for $4x^2 + 3x - 7 \leq 0$

49. 0607_s16_ms_43 Q: 2

Question	Answer	Mark	Part Marks
(a)	$(3x + 2)(x - 4)$	2	SC1 for $(3x + a)(x + b)$ where $ab = -8$ or $a + 3b = -10$
(b)	$-\frac{2}{3} < x < 4$	2FT	B1 for either correct
(c)	221.8 or 221.8... 318.2 or 318.18 to 318.19	3	B2 for either correct or M1 for $\sin x = \text{their} \left(-\frac{2}{3} \right)$ where $-1 < \text{their} \left(-\frac{2}{3} \right) < 1$ or M1 for sketch or M1 for 41.8 or -41.8 seen

50. 0607_w16_ms_43 Q: 9

Question	Answer	Mark	Part Marks
(a)	9 hours 52 mins	3	B2 for 9.870... or M1 for $760 \div 77$
(b) (i)	$\frac{270}{x}$	1	
(ii)	$\frac{270}{x} + \frac{490}{x+4} = 62$ oe $270(x+4) + 490x = 62x(x+4)$ oe	M1 M1	Could be over common denominator
	Completion with no errors	A1	Must be at least one intermediate step
(iii)	$(31x + 54)(x - 10)$ 10 and $-\frac{54}{31}$ or 10 because x cannot be negative 14 cao	M1 B2 B1	or correct substitution into formula or reasonable sketch or B1 for either 10 without support scores only the B1

Paper Perfection, Crafted With Passion

51. 0607_s15_ms_41 Q: 13

Qu.	Answer	Mark	Part Marks
(a)	$(6x + 1)^2 = (5x + 4)^2 + (2x - 1)^2$ oe Any one of $36x^2 + 6x + 6x + 1$ oe $25x^2 + 20x + 20x + 16$ oe $4x^2 - 2x - 2x + 1$ oe Completion to $7x^2 - 24x - 16 = 0$ with no errors or omissions	M1	
		B1	
		A1	
(b)	$(x - 4)(7x + 4)$	2	B1 for $(x + a)(7x + b)$ where $ab = -16$ or $7a + b = -24$
(c)	$0.5 \times 7 \times 24 [=84]$	M2	B1 for $x = 4$
(d)	8.22 or 8.219 to 8.22[0]	4	B1 for $y(y + 2) = 84$ oe M2 for $\frac{-2 \pm \sqrt{(2)^2 - 4(1)(-84)}}{2 \times 1}$ oe or suitable sketch or M1 for formula with 1 error or $(y + 1)^2 - 1 = 84$ oe

52. 0607_s21_ms_41 Q: 3

Question	Answer	Marks	Partial Marks
(a)	38	1	
	$5n + 8$ oe	2	M1 for $5n + c$ or $kn + 8$, $k \neq 0$
(b)	26	1	
	$n^2 - 10$ oe	2	M1 for any quadratic expression or 2nd differences of 2
(c)	6534	1	
	$1089n$ oe	1	
(d)	-64	1	
	$-(-2)^n$ or $2 \times (-2)^{n-1}$ oe	2	M1 for an expression that gives powers of 2 with alternating signs. If 0 scored, SC1 for $2 \times -2^{n-1}$

53. 0607_w21_ms_41 Q: 7

Question	Answer	Marks	Partial Marks
(a)	1, 5, 14,	2	B1 for 2 correct
(b)(i)	-1, -4	B1	
	$14 - 3n$ oe final answer	B2	B1 for $k - 3n$ oe or $14 + cn, c \neq 0$ or correct answer spoiled
(b)(ii)	28, 40	B1	
	$n^2 - 3n$ oe final answer	B2	B1 for any quadratic or M1 for common second differences = 2
(b)(iii)	65, 129	B1	
	$2^n + 1$ oe final answer	B2	B1 for 2^n seen

54. 0607_s20_ms_41 Q: 4

Question	Answer	Marks	Partial Marks
(a)	$(n+3)^2$ oe	2	B1 for any quadratic
(b)	$n^3 + 2$	2	B1 for any cubic
(c)	2^{7-n} oe	2	B1 for 2^{an+b} oe or $\left(\frac{1}{2}\right)^{an+b}$ oe $a \neq 0$

55. 0607_w20_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)	$[y =] \frac{20}{\sqrt{x}}$ oe	2	M1 for $\frac{k}{\sqrt{x}}$ oe
(b)	40	1	FT incorrect k only
(c)	16	2	M1 their $20 = 5\sqrt{x}$ or better

Question	Answer	Marks	Partial Marks
(d)	$[z =] 7 \left(\frac{20}{\sqrt{x}} + 2 \right)$ oe final answer	3	M2 for $z = K \left(\frac{\text{their } 20}{\sqrt{x}} + 2 \right)$ or for $84 = K \left(\frac{\text{their } 20}{\sqrt{4}} + 2 \right)$ oe or M1 for $z = K(y + 2)$ oe

56. 0607_s19_ms_41 Q: 12

Question	Answer	Marks	Partial Marks								
(a)	<table border="1"> <tbody> <tr> <td>(5)</td> <td>(6)</td> </tr> <tr> <td>37</td> <td>37</td> </tr> <tr> <td>24</td> <td>54</td> </tr> <tr> <td>(61)</td> <td>91</td> </tr> </tbody> </table>	(5)	(6)	37	37	24	54	(61)	91	5	B1 for each
(5)	(6)										
37	37										
24	54										
(61)	91										
(b)	$[p =] -3$ $[q =] 1$	2	B1 for each								

57. 0607_s19_ms_42 Q: 8

Question	Answer	Marks	Partial Marks
(a)	$7n$ oe	1	
(b)	$13 - 3n$ oe	2	B1 for $k - 3n$ or $13 - kn$ oe
(c)	2^{n+2} oe	2	B1 for $[c \times] 2^{n+k}$ where c is a power of 2 and k is any integer (including 0) seen
(d)	$n^2 + n$ oe	2	B1 for quadratic expression or for second differences = 2 seen

58. 0607_s18_ms_43 Q: 9

Question	Answer	Marks	Partial Marks
(a)	25 25 16 36 25 41 61	3	B1 for each row
(b)(i)	225 196	2	B1 for each
(b)(ii)	361 400	2	B1 for each
(c)	$n^2 + (n - 1)^2$ oe	2	M1 for 2nd differences all 4 or quadratic expression

59. 0607_w18_ms_41 Q: 7

Question	Answer	Marks	Partial Marks
(a)(i)	$-3n + 83$ oe	2	B1 for $-3n + k$ or $-kn + 83$
(a)(ii)	$128\left(\frac{1}{2}\right)^{n-1}$ oe or 2^{8-n} oe	2	B1 for $128\left(\frac{1}{2}\right)^k$ or 2^{k-n} or 2^{kn+c} oe
(b)	0, 3, 8, 15	2	B1 for 3 correct no extras
(c)	2, 1, 0, 1	2	B1 for 3 correct no extras
(d)(i)	43, 47, 53	2	B1 for 2 correct no extras
(d)(ii)	$41(41 + 1 + 1)$ oe	1	

60. 0607_s17_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	24 $4n$ final answer	2	B1 for each
(a)(ii)	-11 $-2n + 1$ oe final answer	3	B1 for -11 M1 for $kn + 1$ (where $k < 0$) or $-2n + k$
(a)(iii)	108 $3n^2$ oe final answer	3	B1 for 108 M1 for $kn^2 [+ q]$
(a)(iv)	216 n^3 oe final answer	2	B1 for each
(b)	337 $n^3 + 3n^2 + 2n + 1$ oe final answer	3	B1 for 337 M1 for adding <i>their</i> n th terms or 3rd differences = 6 and a cubic with numerical coefficients for the answer

61. 0607_w17_ms_41 Q: 3

Question	Answer	Marks	Partial Marks
(a)	4, 10, 18, 28	2	B1 for any 2 in correct position or 0, 4, 10, 18
(b)(i)	13, 15	1	
(b)(ii)	$2n + 3$ oe	2	B1 for $2n [+ c]$, or $kn + 3$, $k \neq 0$
(c)	$n^2 + 7n + 6$ or $(n + 6)(n + 1)$	2	M1 for 2 <i>their</i> $(2n + 3) + n^2 + 3n$ or 2nd differences = 2, 2, [2] and quadratic or correct unsimplified

62. 0607_w17_ms_42 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	-1 -8	2	B1 for each
(a)(ii)	$-7n + 34$ oe final answer	2	B1 for $-7n + k$ or $-kn + 34$ oe or correct unsimplified seen
(b)(i)	128, 256	2	B1 for each
(b)(ii)	2^{n+2} oe final answer nfwv	2	M1 for $k \times 2^p$ ($k \neq 0$) seen, k numerical and $p = f(n)$

63. 0607_s16_ms_41 Q: 6

Question	Answer	Mark	Part Marks
(a)	$3n + 2$ oe final answer	2	B1 for $3n + k$ or $kn + 2$ oe
(b)	-3, 4, 15, 30	2	B1 for 2 or 3 correct in correct place or -6, -3, 4, 15
(c)	$2n - 3$ oe final answer	3	M2 for $(2n - 3)(n + 2)$ or SC1 for $(2n + a)(n + b)$ where $ab = -6$ or $a + 2b = 1$ OR B1 for -1, 1, 3, 5 B1 for answer $2n + k$ or $kn - 3$
(d)	No and e.g. 502 not a multiple of 5 oe nfwv	2	Dep on $5n - 1$ M1dep for <i>their</i> $(3n + 2) + \text{their } (2n - 3) = 501$ oe Dependent on (a) and (c) linear

64. 0607_s16_ms_42 Q: 12

Question	Answer	Mark	Part Marks
(a)	n^3 cao	1	
(b) (i)	392	2	B1 for second differences 14, 20, 26 and 32
(ii)	$n^3 + n^2$ oe	2	M1 for cubic expression but not n^3 or kn^3 only

65. 0607_w16_ms_42 Q: 11

Question	Answer	Mark	Part Marks
(a)	216 n^3 oe	1 1	
(b)	43 $n^2 + n + 1$ oe	1 3	M2 for $pn^2 + qn + c$ $p, q, c \neq 0$ or M1 for second differences = 2 or $pn^2 + c$ or $pn^2 + qn$
(c)	173 $n^3 - n^2 - n - 1$ oe	1 3	FT their (a) – their (b) FT their (a) – their (b) M2 for $pn^3 + qn^2 + rn + c$ $p, q, r, c \neq 0$ or n^3 – their (b) or M1 for third differences = 6 or for $pn^3 + qn^2 + c$ or $pn^3 + qn^2 + rn$ or $pn^3 + rn + c$

66. 0607_s15_ms_43 Q: 6

Qu.	Answer	Mark	Part Marks
(a) (i)	$4n - 2$	2	B1 for $4n + k$
(ii)	$(4n - 2) \times 10^{(n+1)}$ oe	1FT	their (a) $\times 10^{(n+1)}$
(b) (i)	$2 \times 10^{[1]}, 2 \times 10^{-1}, 2 \times 10^{-3}, 2 \times 10^{-5}$	2	B1 for 2 correct or $2 \times 10^{-3}, 2 \times 10^{-1}, 2 \times 10^{[1]}, 2 \times 10^{-3}$
(ii)	$(2n - 1) \times 10^{(3n-2)}$	3	B1 for $2n - 1$ B2FT for $10^{(3n-2)}$ or M1 for $10^{(n+1) - (3-2n)}$ FT dep on (a)(ii) in correct form

67. 0607_w15_ms_42 Q: 5

Question	Answer	Mark	Part Marks
(a)	-8 $34 - 7n$ oe	1 2	M1 for $-7n + k$ or $34 + kn$ oe $k \neq 0$
(b)	32 $2048 \times \left(\frac{1}{2}\right)^n$ oe e.g. $1024 \times \left(\frac{1}{2}\right)^{n-1}$ or 2^{11-n}	1 2	M1 for $\left(\frac{1}{2}\right)^{n+k}$ oe soi, where k is an integer

68. 0607_m22_ms_42 Q: 5

Question	Answer	Marks	Partial Marks
(a)(i)	$4x^2 + 12x + 9$ final answer	2	B1 for three of $4x^2$, $6x$, $6x$, 9 or for correct answer seen
(a)(ii)	4	1	FT their $9 - 5$
(a)(iii)	$2x + 3 = \pm\sqrt{\text{their } 4}$	M1	their $4 > 0$
	$-2\frac{1}{2}, -\frac{1}{2}$ oe	B1	
(b)(i)	$\frac{6}{\sqrt{w-1}}$ final answer	2	M1 for $[x =]\frac{k}{\sqrt{w-1}}$ oe
(b)(ii)	4	1	FT only incorrect k
(b)(iii)	$\frac{36}{x^2} + 1$ or $\frac{36+x^2}{x^2}$ or $\left(\frac{6}{x}\right)^2 + 1$ final answer	3	M1 for correct multiplication of term in w M1 for correct squaring M1 for correctly isolating w Max M2 if incorrect answer

AcelGCSE
Paper Perfection, Crafted With Passion

69. 0607_m21_ms_42 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	$\frac{32}{x^2}$	2	M1 for $y = \frac{k}{x^2}$
(a)(ii)	2	1	FT their k dependent on $\frac{k}{x^2}$
(a)(iii)	$[\pm] \frac{1}{2}$	2	M1 for $x^2 = \frac{\text{their}32}{128}$ soi by $\frac{1}{4}$ oe
(b)	250	3	B2 for $r = 2(p + 1)^3$ or M1 for $r = k(p + 1)^3$ oe OR M2 for $\frac{r}{(4 + 1)^3} = \frac{16}{(1 + 1)^3}$ oe

70. 0607_s21_ms_42 Q: 8

Question	Answer	Marks	Partial Marks
(a)(i)	$0.05 = \frac{k}{\sqrt{25}}$ oe	M1	
	$k = 0.25$ and $y = \frac{1}{4\sqrt{x}}$	A1	

Question	Answer	Marks	Partial Marks
(a)(ii)	$[\pm] \frac{1}{12}$ oe	1	
(a)(iii)	$\frac{1}{16y^2}$ or $\frac{1}{(4y)^2}$ oe	2	M1 for $4y\sqrt{x} = 1$ or better or for $y^2 = \frac{1}{16x}$
(a)(iv)	$\frac{1}{4}$ oe cao	1	
(b)	3	2	B1 for 2^3 soi

71. 0607_w21_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)	<u>Sequence A</u> -1 9 - 2n oe final answer	3	B1 for -1 B1 for $k - 2n$ or $9 - cn$, $c \neq 0$ or correct answer spoiled
	<u>Sequence B</u> 64 $(n+3)^2$ oe final answer	3	B1 for 64 B1 for $(n+k)^2$, k any integer or M1 for second differences = 2
	<u>Sequence C</u> 8 2^{n-2} oe final answer	3	B1 for 8 B1 for 2^{n+k} , k any integer
(b)	$\frac{5184}{\frac{3}{x^2}}$ oe	4	B3 for $z = \frac{k}{\frac{3}{x^2}}$ or for $y = \frac{12}{\sqrt{x}}$ and $z = 3y^3$ or B2 for $y = \frac{12}{\sqrt{x}}$ or $z = 3y^3$ or M1 for $y = \frac{k}{\sqrt{x}}$ or $z = ky^3$

72. 0607_w21_ms_43 Q: 7

Question	Answer	Marks	Partial Marks
(a)(i)	$[y =] \frac{45}{x^2}$	2	M1 for $y = \frac{k}{x^2}$ oe
(a)(ii)	$[\pm] 1.5$ oe	2	M1 for $x^2 = \frac{their 45}{20}$ or better
(b)	$[z =] 4\sqrt{\frac{45}{x^2}}$ oe	3	B2 for $z = 4\sqrt{y}$ oe or M1 for $z = k\sqrt{y}$

73. 0607_s19_ms_41 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	$y = \frac{18}{\sqrt{x}}$ oe	2	M1 for $y = \frac{k}{\sqrt{x}}$ oe
(a)(ii)	3.29 or 3.286...	1	FT wrong k only
(a)(iii)	1.44 oe	2	M1 for $\sqrt{x} = \frac{\text{their}18}{15}$ or $225 = \frac{(\text{their}18)^2}{x}$
(b)	$z = 3\left(\frac{18}{\sqrt{x}} + 5\right)$ oe	2	M1 for $z = K(\text{their}(a(i)) + 5)$ $K \neq 1$ or for $z = 3(y + 5)$

74. 0607_s19_ms_43 Q: 12

Question	Answer	Marks	Partial Marks
(a)(i)	6.4	3	M2 for $y = 1.6\sqrt{x+1}$ or M1 for $y = k\sqrt{x+1}$ OR M2 for $y = \frac{8\sqrt{16}}{\sqrt{25}}$ or M1 for $\frac{8}{\sqrt{25}} = \frac{y}{\sqrt{16}}$

Question	Answer	Marks	Partial Marks
(a)(ii)	99	2	FT M1 for $\sqrt{x+1} = \frac{16}{\text{their}1.6}$ oe only FT $\sqrt{x+1}$
(b)(i)	-7	1	
(b)(ii)	38	1	
(b)(iii)	-0.1 oe	1	
(b)(iv)	120	2	B1 for row of 0 6 12 18 reached or M1 for $(n-2)^3 - (n-2)$ or $(n-1)(n-2)(n-3)$ oe

75. 0607_s18_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)(i)	$8\sqrt{x}$ oe	2	M1 for $y = k\sqrt{x}$
(a)(ii)	16	1	
(a)(iii)	$\frac{y^2}{64}$ or $\left(\frac{y}{8}\right)^2$ or $\frac{y^2}{8^2}$	2	FT only if wrong k , k numeric and $k \neq 1$ M1 for $\frac{y}{\text{their } k} = \sqrt{x}$ or $y^2 = (\text{their } k\sqrt{x})^2$ $k \neq 1$ or better SC1 for answer $\frac{y^2}{k^2}$ or $\left(\frac{y}{k}\right)^2$

Question	Answer	Marks	Partial Marks
(b)	2	3	M2 for $p = \frac{12}{q+2}$ oe or $p = \frac{12}{4+2}$ oe or M1 for $p = \frac{k}{q+2}$ OR M2 for $p = \frac{3(2+2)}{4+2}$ or M1 for $p(4+2) = 3(2+2)$

76. 0607_w18_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	$y = 4(x+2)^2$	2	B1 for $y = k(x+2)^2$
(a)(ii)	1600	1	FT (<i>their</i> k) $\times 20^2$ dep on $k(x+2)^2$

Question	Answer	Marks	Partial Marks
(a)(iii)	$\frac{1}{2}$ oe, $-\frac{9}{2}$ oe	2	B1 for 0.5 or $-\frac{9}{2}$ oe or M1 for $25 = (\text{their } k)(x+2)^2$
(b)	54	2	B1 for 3 soi by answer 6

77. 0607_s17_ms_41 Q: 6

Question	Answer	Marks	Partial Marks
(a)	8	3	M1 for $y = \frac{k}{x^2}$ oe A1 for $k = 128$ OR M2 for $32 \div \left(\frac{4}{2}\right)^2$ oe or M1 for $\frac{y}{32} = \frac{4^2}{\frac{1}{2^2}}$ oe
(b)	$[\pm] \frac{1}{2}$ oe	2	M1 for $x^2 = \frac{\text{their } k}{512}$ oe or $2 \times \sqrt{\frac{32}{512}}$ oe
(c)	$[x = \pm] \sqrt{\frac{128}{y}}$ oe final answer	3	M1 for multiplication by x^2 M1 for division by y or for square root

78. 0607_w16_ms_43 Q: 12

Question	Answer	Mark	Part Marks
(a)	$y = \frac{10}{\sqrt{x}}$	2	M1 for $y = \frac{k}{\sqrt{x}}$
(b)	$\frac{100}{9}$ oe	2FT	M1 for $3\sqrt{x} = \text{their } k$
(c)	$a = 4000, n = -\frac{3}{2}$	3	B2 for either or M1 for $z = c \left(\frac{\text{their } k}{\sqrt{x}}\right)^3$ oe