01. 0607_m24_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)	(2, 4)	**2**	**B1** for each coordinate
(b)	$y = -\frac{1}{3}x + 4\frac{2}{3}$ oe cao final answer	**3**	**M1** for $\frac{2-6}{8-(-4)}$ **M1** for substituting (2, 8) or (–4, 6) into $y = their\left(-\frac{1}{3}\right)x + c$ oe

Question	Answer	Marks	Partial Marks
(c)	Gradient = for $-1 \div \left(their -\frac{1}{3}\right)$ oe	**M1**	
	substituting *their* (2, 4) into $y = their3x + c$ oe	**M1**	
	Completion to $y = 3x - 2$ with no errors or omissions	**A1**	Dep on M1, M1
(d)	$3 \times 3 - 2 = 7$	**1**	
(e)	20	**4**	**M1** for $[AB =] \sqrt{(8+4)^2 + (2-6)^2}$ **M1** for $[h =] \sqrt{(7 - their4)^2 + (3 - their2)^2}$ **M1** for $\frac{1}{2} \times their\sqrt{160} \times their\sqrt{10}$

02. 0607_s24_ms_41 Q: 9

Question	Answer	Marks	Partial Marks
(a)	74 900 or 74 929 to 74 941.1	3	**M2** for $\frac{1}{3}\times\pi\times40^2\times\sqrt{60^2-40^2}$ oe or **M1** for 60^2-40^2 [=2000] oe
(b)	$\pi\times40^2+\pi\times40\times60$ $=4000\pi$ with no errors	M2	**M1** for $\pi\times40^2$ or $\pi\times40\times60$

Question	Answer	Marks	Partial Marks
(c)	Ratio areas = $4000\pi : 1000\pi$ implies Ratio sides = 2 : 1 oe	M1	
	[r=] 40 × 0.5 = 20 oe	A1	
	ALTERNATIVE $40\times\sqrt{\frac{1000\pi}{4000\pi}}$ oe = 20 with no errors	(M2)	**M1** for $\sqrt{\frac{1000\pi}{4000\pi}}$ or $\sqrt{\frac{4000\pi}{1000\pi}}$ oe or $\left(\frac{40}{x}\right)^2=\frac{4000\pi}{1000\pi}$ oe
(d)	11 900 or 11 930 to 11 940 or 3800π	3	**M2** for $\pi\times40^2+\pi\times20^2+\pi\times60\times40-\pi\times30\times20$ or **M1** for $\pi\times60\times40-\pi\times30\times20$ If 0 scored, **SC1** for 3400π or 10 700 or 10 680 to 10 681.4…

03. 0607_s24_ms_42 Q: 1

Question	Answer	Marks	Partial Marks
(a)	17	3	**M1** for $\frac{1}{2}\times 8\times 7$ **M1** for 476 ÷ *their* area of triangle
(b)(i)	62.88	1	
(b)(ii)	2400	3	**M2** for $6\times\left(\sqrt[3]{8000}\right)^2$ oe or **M1** for $\sqrt[3]{8000}$ oe
(b)(iii)	44 cao	3	**M2** for $8000\div\left(\frac{4}{3}\pi 3.5^3\right)$ or **M1** for $\frac{4}{3}\pi 3.5^3$

04. 0607_s24_ms_42 Q: 5

Question	Answer	Marks	Partial Marks
(a)	62.4 or 62.35...	2	**M1** for $\frac{1}{2}\times 12\times 12\times\sin 60$ oe
(b)	286 or 286.4 to 286.5	3	**M2** for $\pi\times$ (*their* radius)^2 or **M1** for $2\pi r = 60$ or better
(c)	277 or 276.9 to 277.0	4	**M3** for [10 ×] $\frac{1}{2}\times 6\times$ *their* height oe or [10×]$\frac{1}{2}\times\left(\frac{3}{\sin 18}\right)^2\times\sin 36$ or **M2** for 3 tan72 or $\frac{3}{\sin 18}$ oe or **M1** for angles 72 or 36 or 18 or 144 seen

05. 0607_s24_ms_43 Q: 7

Question	Answer	Marks	Partial Marks
(a)	$\pi d = 37 - 12 - 12$ oe	M1	
	4.137 to 4.138...	A1	

Question	Answer	Marks	Partial Marks
(b)	40.3 or 40.4 or 40.33 to 40.36…	3	**M2** for $2 \times \sin^{-1}\frac{4.14}{12}$ oe or $\cos ACB = \frac{12^2+12^2-(2\times 4.14)^2}{2\times 12\times 12}$ or **M1** for $\sin(...) = \frac{4.14}{12}$ or $(2\times 4.14)^2 = 12^2+12^2-2\times 12\times 12\times \cos ACB$
(c)	60[.0] or 60.1 or 60.01 to 60.13	3	**M1** for $\frac{1}{2}\times 12\times 12\times \sin(their\ b)$ oe **M1** for $2\times\frac{1}{2}\times\pi\left(\frac{4.14}{2}\right)^2$ oe
(d)	28.2 or 28.3 or 28.23 to 28.26	3	**M2** for $37\times\sqrt{\frac{35}{their\ c}}$ oe or **M1** for $\sqrt{\frac{35}{their\ c}}$ or $\sqrt{\frac{their\ c}{35}}$ or $\frac{35}{their\ c}=\left(\frac{p}{37}\right)^2$

06. 0607_s24_ms_43 Q: 8

Question	Answer	Marks	Partial Marks
(a)	$h^2 = 0.8^2 - 0.35^2 - 0.35^2$ oe	M3	**M2** for $0.8^2 = 0.35^2 + 0.35^2 + h^2$ oe or **M1** for $0.35^2 + 0.35^2$ or $0.7^2 + 0.7^2$ oe
	0.6284 to 0.6285	A1	
(b)	165 or 165.0 to 165.2	5	**B4** for 262 or 262.1 to 262.2… OR **M1** for $6 \times 4.9 \times 4.9$ **M1** for $\pi \times 1.2^2 \times 25$ **M1** for $\frac{1}{3}\times 0.7\times 0.7\times 0.628$ [× 49] **M1** for at least 1 of *their* volumes × 0.63

Question	Answer	Marks	Partial Marks
(a)(i)	Fully correct method for area	**M3**	e.g. [Area] $= \frac{1}{2} \times \left(2 \times \frac{\sqrt{3}r}{2}\right)^2 \sin 60$ or Area of $BOC = \frac{1}{2}r^2 \times \sin 120$ $= \frac{1}{2}r^2 \times \frac{\sqrt{3}}{2}$ Area of $ABC = 3 \times \frac{1}{2}r^2 \times \frac{\sqrt{3}}{2}$ or Side by cosine rule = $r\sqrt{3}$ Then $0.5 \times a^2 \times \sin 60$ or $\frac{\sqrt{3}}{4}(side)^2 = \frac{\sqrt{3}}{4}(r\sqrt{3})^2$ $= \frac{3\sqrt{3}}{4}r^2$ or **M2** for correct method length of side or **M1 for** $\cos 30 = \frac{\sqrt{3}}{2}$ oe
	Completion to answer with no errors	**A1**	
(a)(ii)	$\pi r^2 - \frac{3\sqrt{3}}{4}r^2$ oe	**1**	
(b)	[Area =] $3\sqrt{3}r^2 - \pi r^2$ oe	**3**	**M2** for $0.5 \times \left(\frac{2r}{\tan 30}\right)^2 \times \sin 60$ oe or **M1** for $EF = \frac{2r}{\tan 30}$ oe
(c)	1 : 2	**2**	**B1** for unsimplified

08. 0607_s23_ms_41 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	75	2	**M1** for $5^2[\times 3]$
(a)(ii)	268 or 268.0 to 268.1...	2	**M1** for $\frac{4}{3} \times \pi \times 4^3$
(b)	2.52 or 2.522 to 2.523...	2	**M1** for $\pi \times r^2 \times 6 = 120$ or better
(c)	7.42 or 7.422 to 7.423	3	**M1** for $\frac{1}{3} \times \pi \times r^2 \times 6 = 120$ oe or better **M1** for $6^2 + (their\ r)^2$ or better

09. 0607_s23_ms_41 Q: 7

Question	Answer	Marks	Partial Marks
(a)(i)	26.6 or 26.56 to 26.57	2	**M1** for $\tan = \frac{6}{12}$ oe
(a)(ii)	13.4 or 13.41 to 13.42	2	**M1** for $6^2 + 12^2$ oe
(a)(iii)	56.4 to 56.5	3	**M2** for $2 \times 10 + 2 \times 12 + \frac{2 \times their CMN}{360} \times 2 \times \pi \times their\ MC$ or **M1** for $\frac{2 \times their CMN}{360} \times 2 \times \pi \times their\ MC$ oe
(a)(iv)	203 to 205	5	**M1** for $\frac{2 \times their CMN}{360} \times \pi \times (their\ MC)^2$ **M2** for $\frac{1}{2} \times 12 \times \sqrt{10^2 - 6^2}$ oe or **M1** for $10^2 - 6^2$ **B1** for 144 or 72 or 36

Question	Answer	Marks	Partial Marks
(b)	248	3	**M2** for $558 \times \left(\sqrt[3]{\frac{240}{810}}\right)^2$ oe or **M1** for $\left(\sqrt[3]{\frac{240}{810}}\right)^2$ or $\left(\sqrt[3]{\frac{810}{240}}\right)^2$ or for $\left(\frac{810}{240}\right)^2 = \left(\frac{558}{area}\right)^3$ oe

10. 0607_s23_ms_42 Q: 5

Question	Answer	Marks	Partial Marks
(a)(i)	72	1	
(a)(ii)	$\frac{5}{\sin\left(\frac{1}{2}their72\right)}$ oe	M2	**M1** for $\sin\left(\frac{1}{2}their72\right)=\frac{5}{OD}$ oe
	8.506 to 8.507	A1	
(a)(iii)	172 or 172.0 to 172.2	2	**M1** for $\frac{1}{2}\times 8.51^2\times\sin(their\ 72)$ oe or $\frac{1}{2}\times 8.51\times(10\text{ or }5)\sin 54$ oe or $\frac{1}{2}\times(10\text{ or }5)\times 5\tan 54$ oe
(b)(i)	15.9 or 15.86...	3	**M2** for $18^2-8.51^2$ or **M1** for $VO^2+8.51^2=18^2$
(b)(ii)	909 to 913	2	**M1** for $\frac{1}{3}\times(their172)\times(their15.9)$
(b)(iii)	11.8 or 11.79 to 11.82	3	**M2** for $10\times\sqrt[3]{\frac{1500}{their\textbf{(b)(ii)}}}$ oe or **M1** for $\sqrt[3]{\frac{1500}{their\textbf{(b)(ii)}}}$ or $\sqrt[3]{\frac{their\textbf{(b)(ii)}}{1500}}$ or $\frac{their\textbf{(b)(ii)}}{1500}=\left(\frac{10}{x}\right)^3$ oe

11. 0607_s23_ms_42 Q: 7

Question	Answer	Marks	Partial Marks
(a)	$y=\frac{1}{2}x+6$ oe final answer	3	**B2** for $\frac{1}{2}x+6$ OR **M1** for $\frac{10-2}{8-(-8)}$ oe **M1** for substituting (–8, 2) or (8, 10) into $y=(their\ m)x+c$ oe
(b)	$\frac{1}{2}\times 4+6=8$ oe	1	

Question	Answer	Marks	Partial Marks
(c)	$y = -2x + 16$ oe final answer	3	**B2** for $-2x + 16$ OR **M1** for grad $= -\frac{1}{their\ \frac{1}{2}}$ **M1** for substituting (4, 8) into $y = (their\ m)x + c$ oe, $their\ m \neq their\ \frac{1}{2}$
(d)(i)	(6, 4)	2	**B1** for each coordinate
(d)(ii)	Kite	1	
(d)(iii)	17.9 or 17.88 to 17.89 or $8\sqrt{5}$ oe	2	**M1** for $(8 - (-8))^2 + (10 - 2)^2$
(d)(iv)	80 or 79.5 to 80.5	3	**M2** for $\frac{1}{2}$ × *their* **(d)(iii)** × *their BD* or $2 \times \frac{1}{2}$ × *their* **(d)(iii)** × *their BN* oe i.e. a correct method for the area of *ABCD*. or **B1**for [*BN* =] 4.47 or 4.472... or $2\sqrt{5}$ oe or [*BD* =] 8.94 or 8.944... or $4\sqrt{5}$ oe or **M1** for a correct method for the area of one of the triangles in *ABCD*.

12. 0607_s23_ms_43 Q: 11

Question	Answer	Marks	Partial Marks
(a)	5440	2	**M1** for $20 \times 34 \times 8$ or $20 \times 34 \times 16$
(b)	8.39 or 8.394…	4	**B3** for 0.394 or 0.394… OR **M3** for $q = \frac{\frac{4}{3}\pi(4)^3\ [+their(\boldsymbol{a})]}{680}$ or **M2** for $(20 \times 34)q = \frac{4}{3}\pi(4)^3\ [their(\boldsymbol{a})]$ or **M1** for $\frac{4}{3}\pi(4)^3$
(c)(i)	6.67 or 6.666 to 6.667	3	**M2** for $\frac{20}{3}$ and $\frac{34}{5}$ or **M1** for $\frac{20}{3}$ or $\frac{34}{5}$ or recognition of 3 by 5

Question	Answer	Marks	Partial Marks
(c)(ii)	14.5 or 14.53 to 14.55	3	**B2** for 6.53 to 6.55 OR **M2** for $p=\frac{15\times(their\textbf{(c)(i)})^3[+their\textbf{(a)}]}{20\times34}$ or **M1** for $20\times34p=15\times(their\textbf{(c)(i)})^3[+their\textbf{(a)}]$

13. 0607_w23_ms_41 Q: 8

Question	Answer	Marks	Partial Marks
(a)	22[.0] or 21.99...	2	**M1** for $\frac{140}{360}\times2\times\pi\times9$ oe
(b)	99[.0] or 98.96 to 98.97...	2	**M1** for $\frac{140}{360}\times\pi\times9^2$ oe
(c)	998 or 997.7 to 998.0	4	**M1** for *their* **(a)** × 20 **M1** for *their* **(b)** × 2 **M1** for [2 ×] 9 × 20
(d)	1230 or 1231 to 1232...nfww	2	**FT** *their* **(c)** $\times\left(\frac{10}{9}\right)^2$ **M1** for $\left(\frac{10}{9}\right)^2$ or $\left(\frac{9}{10}\right)^2$

14. 0607_w23_ms_41 Q: 11

Question	Answer	Marks	Partial Marks
(a)	29.3 or 29.25...	2	**M1** for $\frac{1}{2}\times8\times10\sin47$
(b)	5.85 to 5.86	3	**M2** for $\sin47=\frac{\text{distance}}{8}$ oe or for $\frac{2\times their\textbf{(a)}}{10}$ oe or **M1** for recognition of shortest distance
(c)	$\sqrt{8^2+10^2-2\times8\times10\cos47}$	M2	**M1** for $8^2+10^2-2\times8\times10\cos47$ oe **A1** for 54.9 or 54.88...
	7.408...	A1	

Question	Answer	Marks	Partial Marks
(d)	5.06 or 5.07 or 5.064 to 5.066	4	**M3** for $\frac{\frac{1}{2}\times 7.41}{\sin 47}$ oe or **M2** for $\sin 47 = \frac{\frac{1}{2}\times 7.41}{\text{radius}}$ oe or **M1** for angle $BOC = 94$ soi

15. 0607_w23_ms_42 Q: 8

Question	Answer	Marks	Partial Marks
(a)(i)	26	2	**M1** for $10^2 + 24^2$ or better
(a)(ii)	15.2 or 15.19 to 15.20	3	**M2** for $\sqrt{20^2 - \left(\frac{\text{their } 26}{2}\right)^2}$ **M1** for $20^2 - \left(\frac{\text{their } 26}{2}\right)^2$
(a)(iii)	71.8 or 71.78 to 71.80…	3	**M2** for $\tan EFM = \frac{\sqrt{231}}{5}$ or using *their* height oe **ALT** **M1** for $EF^2 = 20^2 - 12^2$ **M1** for $\cos EFM = \frac{5}{\text{their } EF}$ or **B1** for identifying correct angle or stating EFM
(b)(i)	10.5	3	**M2** for $\sqrt[3]{\frac{222.75}{66}} \times 7$ oe or **M1** for $\sqrt[3]{\frac{222.75}{66}}$ oe or $\left(\frac{7}{l}\right)^3 = \frac{66}{222.75}$
(b)(ii)	2.51 or 2.506 to 2.507…	2	**M1** for $\sqrt[3]{\frac{66\times 3}{4\pi}}$

16. 0607_w23_ms_43 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	400	2	**M1** for $\frac{1}{3} \times 10^2 \times 12$
(a)(ii)	$\sqrt{\left(\frac{10}{2}\right)^2 + 12^{12}}$ leading to 13	**M2**	**M1** for $[VM^2 =] \left(\frac{10}{2}\right)^2 + 12^2$

Question	Answer	Marks	Partial Marks
(b)(i)	195.2 or 195	4	**B3** for 204.8 OR **B2** for 9.6 or awrt 9.6 or **M1** for [height of small pyramid] = $12 \times \frac{8}{10}$ oe **M1** for $\frac{1}{3} \times 8^2 \times$ (*their* 9.6) OR **M3** for *their* $400 \times \left(1 - \left(\frac{8}{10}\right)^3\right)$ oe or **M2** for *their* $400 \times \left(\frac{8}{10}\right)^3$ oe or **M1** for $\left(\frac{8}{10}\right)^3$ oe
(b)(ii)	257.6 or 258	4	**B1** for $13 \times \frac{2}{10}$ or $13 \times \frac{8}{10}$ **M1** for $8 \times$ (*their* 2.6) $+ 2 \times \frac{1}{2} \times 1 \times$ (*their* 2.6) oe **M1** for 8^2 and 10^2 soi

17. 0607_w20_ms_41 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	25.0 cao	**1**	
(a)(ii)	25.0 cao	**1**	
(a)(iii)	30	**1**	
(a)(iv)	25.047	**1**	
(a)(v)	$2.50467\times10^{[1]}$	**1**	
(b)(i)	0.2[0] oe	**1**	
(b)(ii)	200 000	**1**	
(b)(iii)	5	**2**	**M1** for $\times1000\div3600$

18. 0607_s15_ms_41 Q: 3

Qu.	Answer	Mark	Part Marks
(a)	20	**1**	
(b)	13.225	**2**	or **M1** for (264.5 or 260 or 269) ÷ *their* **(a)** oe

19. 0607_s21_ms_42 Q: 11

Question	Answer	Marks	Partial Marks
(a)	$8 - -2 = 10$, $3 : 2 = 6 : 4$, $x = -2 + 6 = 4$ oe 4 to $-1 = 5$, $y = 4 - 3 = 1$ oe	**M2**	**M1** for each coordinate
(b)	$y = 2x - 7$ oe final answer	**4**	**B3** for $2x - 7$ as final answer OR **M1** for gradient of $AB = \frac{-1-4}{8-(-2)}$ **M1** for $m = \frac{-1}{their\left(-\frac{1}{2}\right)}$ **M1** for $1 = (their2) \times 4 + c$ or $y - 1 = their2(x - 4)$)
(c)	$2 \times 6 - 7 = 5$ oe	**1**	
(d)(i)	$5\sqrt{5}$ or $\sqrt{125}$ final answer	**2**	**M1** for $(8 - (-2))^2 + ((-1) - 4)^2$ oe
(d)(ii)	25 [.0] cao nfww	**3**	**M1** for $(6 - 4)^2 + (5 - 1)^2$ **M1 dep on first M1** for $\frac{1}{2} \times their(d)(i) \times their\sqrt{20}$

20. 0607_s20_ms_43 Q: 10

Question	Answer	Marks	Partial Marks
(a)	$\frac{1}{2}\times 4x(2x+4) =$ $\frac{1}{2}(2x+1)(4x+5)\sin 30$	**M2**	**M1** for either area
	$\sin 30 = \frac{1}{2}$ and eliminating fractions	**M1**	
	Expanding brackets	**M1**	**FT**
	Completion to $8x^2 + 18x - 5 = 0$ with no errors	**A1**	
(b)	$(4x-1)(2x+5) = 0$	**M1**	or $x = \frac{-18 \pm \sqrt{18^2 - 4\times 8\times(-5)}}{2\times 8}$ or sketch of parabola (U shaped) with one +ve and one –ve zero.
	$\frac{1}{4}, -2\frac{1}{2}$ oe	**A2**	**A1** for each. If 0 scored, **SC1** for $\frac{1}{4}, -2\frac{1}{2}$
(c)	2.25	**2**	**M1** for substituting *their* positive solution in either area formula.

21. 0607_w18_ms_43 Q: 12

Question	Answer	Marks	Partial Marks
(a)	4.75	**3**	**B2** for $8x = 38$ oe or **M1** for $2\{(3x + 2) + (x + 1)\} = 44$ or $(3x + 2) + (x + 1) = 22$
(b)	17 cao	**3**	**B2** for 16 and 17 seen or sketch showing 17 or $(y+16)(y-17)$ seen or $\frac{-(-1) \pm \sqrt{(-1)^2 - 4(1)(-272)}}{2(1)}$ oe or **B1** for 17 seen or **M1** for $y(y - 1) = 272$ or better or appropriate sketch but not indicating 17
(c)	2.5 oe	**3**	**M2** for $vw = 5$ and $(v + 1)w = 7$ oe or **M1** for one of these equations oe
(d)	1.69 or 1.690… only cao	**4**	**M3** for $6p^2 - 6p - 7[=0]$ oe or **M2** for $2\left(2p + \frac{9}{2p}\right) + 2 = 2\left(3p + \frac{10}{3p}\right)$ oe or **M1** for $\frac{9}{2p}$ or $\frac{10}{3p}$ soi

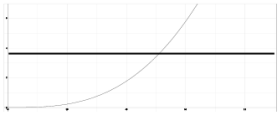
22. 0607_s17_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)(i)	[$y =$] $\frac{1}{2}x + 1$	3	**M1** for gradient = $\frac{8-2}{14-2}$ oe **M1** for correct substitution of (2, 2) or (14, 8) into $y = (their\ m)x + c$ oe soi
(a)(ii)	[$y =$] $-2x + 26$	3	**M1** for gradient = $\frac{-1}{their\ \frac{1}{2}}$ **M1**for substituting (11, 4) into $y = (their - 2)x + c$ oe soi
(b)	Correct substitution and completion of (10, 6) for both lines oe	2	**B1** for either OR **M1** for correct elimination of x or y from equations **A1** for completion to solution (10, 6)
(c)	(9, 8)	1	
(d)	30 cao	4	**M3** for $\left[\frac{1}{2}\right] \times \sqrt{12^2 + 6^2} \times \sqrt{2^2 + 4^2}$ oe or **B2** for two of $\sqrt{12^2 + 6^2}$ oe (AC), $\sqrt{2^2 + 4^2}$ oe (BD or MC), $\sqrt{8^2 + 4^2}$ oe (AM), $\sqrt{2^2 + 1^2}$ oe (MD or MB) or **B1** for one of these. (M is the intersection of AC and BD) OR **M3** for full area e.g. $[0.5 \times 12 \times 6 - 0.5 \times 6 \times 7] \times 2$ or **B2** for 2 correct areas evaluated or **B1** for 1 correct area evaluated

23. 0607_s16_ms_42 Q: 4

Question	Answer	Mark	Part Marks
(a)	24	**3**	**M2** for $6w + 5(w + 30) = 414$ oe or better or **B1** for $6w$ and $5(w + 30)$ oe
(b)	$2x^2 + 4x - 7$ [$= 0$] oe	**B2**	i.e. a correct simplified quadratic equation **M1** for $x^2 + (x + 1)(x + 3)$ [$= 10$] oe
	Sketch of appropriate graph or correct use of formula or completing square	**M1 dep**	Dep on a quadratic from addition of two areas. Must see some valid method
	4.48 or 4.49	**B2**	**B1** for 4.484 to 4.485… or $6\sqrt{2} - 4$ or 1.12 or 1.121… or $1.5\sqrt{2} - 1$

24. 0607_m22_ms_42 Q: 11

Question	Answer	Marks	Partial Marks
(a)	114.6 or 114.5 to 114.6	**3**	**M2** for $\frac{y}{360}\times 2\pi r = 2r$ oe or **M1** for $\frac{y}{360}\times 2\pi r$ oe
(b)(i)	$\frac{x}{360}\times\pi\times 8^2 - \frac{1}{2}\times 8^2\times\sin x = A$	**M2**	**M1** for $\frac{x}{360}\times\pi\times 8^2$ or $\frac{1}{2}\times 8^2\times\sin x$
(b)(ii)	18.3 or 18.26 to 18.27...	**1**	
(b)(iii)	Correct sketch of curve and line 	**B2**	**B1** for correct shape of curve
	58.9 or 58.90 to 58.92	**1**	

25. 0607_w18_ms_42 Q: 6

Question	Answer	Marks	Partial Marks
(a)	36 or 54 or 72 or 108 or 540 seen	**B1**	
	5 ÷ cos 54 oe	**M2**	or **M1** for $\cos 54 = \frac{5}{r}$ oe Starting with 8.51 is **M0**
	8.506 to 8.507	**A1**	
(b)(i)	20.7 or 20.68 to 20.70	**3**	**M2** for $\frac{72}{360}\times 2\times\pi\times 8.51 + 10$ oe or **M1** for $\frac{72}{360}$ oe soi by ÷ 5
(b)(ii)	11.0 or 11.1 or 11.02 to 11.10...	**3**	**M1** for $\frac{72}{360}\times\pi\times 8.51^2$ oe **M1** for $0.5\times 8.51^2\times\sin 72$ oe

26. 0607_s16_ms_43 Q: 4

Question	Answer	Mark	Part Marks
(a) (i)	$A = 4r^2 - \pi r^2$ oe final answer	**2**	**M1** for $ar^2 - b\pi r^2$
(ii)	30.9 or 30.88 to 30.90[…]	**1**	
(b)	$8r + 2\pi r$ oe final answer	**3**	**B1** for $8r$ oe **B1** for $2\pi r$ oe If **B0** scored then **M1** for $r + r + \frac{1}{4}\times 2\pi r$ oe

27. 0607_s16_ms_43 Q: 13

Question	Answer	Mark	Part Marks
(a) (i)	4.71 or 1.5π or 4.712 to 4.713	2	**M1** for $\frac{60}{360}\times\pi\times3^2$
(ii)	12.5 or $1.5\pi+4.5\sqrt{3}$ oe or 12.50 to 12.51	3	**M2** for $0.5\times3\times\frac{3}{\cos60}\times\sin60+their(a)$ oe or **M1** for $\frac{3}{\cos60}$
(iii)	31.4 or $7.5\pi+4.5\sqrt{3}$ oe or 31.35 to 31.36	3	**B1** for hyp = 6 **M1** for $\frac{60}{360}\times\pi\times(their6)^2$
(b)	263 or $31.5\pi+94.5\sqrt{3}$ oe or 262.6 to 262.7	4	**M3** for $1.5\pi+6\pi+24\pi+4.5\times\sqrt{3}+18\times\sqrt{3}+72\times\sqrt{3}$ or **M1** for $1.5\pi+6\pi+24\pi$ **and M1** for $4.5\times\sqrt{3}+18\times\sqrt{3}+72\times\sqrt{3}$ or **M1** for correct new triangle in diagram 4 or **M1** for correct new sector in diagram 5 or **M1** for correct new triangle in diagram 6

28. 0607_m21_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)	8 : 19 oe	3	**M1** for [Vol A : Vol B =] $2^3:3^3$ oe **M1** for [Vol C =] $27k-8k$ k any variable OR **M1** for $\frac{1}{3}\pi\left(\frac{3r}{2}\right)^2\times\frac{3h}{2}$ **M1** for [V_A : V_C =] $\frac{1}{3}\pi r^2h:\frac{1}{3}\left(\frac{19}{8}\right)\pi r^2h$

Question	Answer	Marks	Partial Marks
(b)	503 or 502.6 to 502.8	**8**	**M1** for $\frac{3}{2}\times 4$ oe or $\frac{3}{2}\times 10$ or $\frac{3}{2}\times$ *their l* oe if *their l* is from Pythagoras or $\frac{3^2}{2^2}$ **M2** for $\sqrt{4^2+10^2}$ or $\sqrt{(\text{their } R)^2+(\text{their } H)^2}$ or **M1** for 4^2+10^2 or $(\text{their } R)^2+(\text{their } H)^2$ **M1** for $\pi\times 4\times\sqrt{116}$ **M1** for $\pi\times 6\times\frac{3}{2}\sqrt{116}$ or $\frac{3^2}{2^2}\times\pi\times 4\sqrt{116}$ **M2** for CSAa + CSAb + $\pi\times(\text{their } R)^2-\pi\times 4^2$ oe or **M1** for for CSAa + CSAb or $\pi\times(\text{their } R)^2-\pi\times 4^2$ oe

29. 0607_s19_ms_43 Q: 1

Question	Answer	Marks	Partial Marks
(a)	2.5	**2**	**M1** for $7\times 3\times h=52.5$ or better
(b)	4500	**2**	**M1** for $\frac{1}{3}\times 500\times 27$ oe

30. 0607_w19_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)	$[(14\times18)+0.5\times14\times8]\times24$ oe or $18\times14\times24+0.5\times14\times8\times24$ oe leading to 7392	**M3**	i.e. area × length volume + volume **M2** for $14\times18+0.5\times14\times8$ or **M1** for 14×18 or $0.5\times14\times8$ or $0.5\times(18+26)\times7$
(b)	12 cao	**3**	**M2** for $24\div\sqrt[3]{\frac{7392}{924}}$ oe or **M1** for $\sqrt[3]{\frac{7392}{924}}$ soi
(c)	12.1 or 2.08…	**2**	**M1** for $r^3=\frac{3}{4}\times\frac{7392}{\pi}$ oe
(d)	48.2 or 48.3 or 48.4 or 48.20 to 48.37…	**2**	**M1** for $h=\frac{3\times7392}{\pi\times(their12.1)^2}$
(e)	$\pi r^2\sqrt{17}$ final answer	**3**	**M2** for $\pi r\sqrt{r^2+(4r)^2}$ or **M1** for $l^2=r^2+(4r)^2$ If 0 scored , **SC1** for $\pi r^2\sqrt{5}$

31. 0607_s18_ms_41 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)(a)	$2\pi r$ = 12 oe	**M1**	
	1.9096 to 1.9099	**A1**	
(a)(i)(b)	458 or 457.9 to 458.5	**2**	**M1** for $\pi\times1.91[0]^2\times40$
(a)(ii)	1070	**4**	**B3** for volume of other cylinder 1530 or 1527 to 1529. … or **M2** for $\pi\times\left(\frac{40}{2\pi}\right)^2\times12$ or **M1** for $40\div(2\pi)$ oe
(b)	40	**4**	**M3** for $\sqrt[3]{\frac{4.8\times100^3}{75}}$ oe or **M1** for $\sqrt[3]{\frac{\text{figs } 48}{\text{figs } 75}}$ oe or $\sqrt[3]{\frac{\text{figs } 75}{\text{figs } 48}}$ oe **and M1** for 4.8×100^3 or $75\div100^3$ oe

32. 0607_s18_ms_42 Q: 7

Question	Answer	Marks	Partial Marks
(a)	90	**2**	**M1** for $55 + 5k$, $k = 7$ or 8
(b)	11	**2**	**M1** for $55 + 5(n - 1) = 105$ or better or $\frac{105 - 55\,[+5]}{5}$ soi by 10
(c)	82.5	**2**	**M1** for $\frac{42}{28} = \frac{[\ ]}{55}$ oe
(d)(i)	$28 + 2a = 44$ oe or $44 - 28$ oe seen	**M1**	
	$2a = 16$ or $\frac{44 - 28}{2}$ oe[= 8]	**A1**	
(d)(ii)	56 900 or 56 900 to 56 920	**2**	**M1** for $\frac{\pi}{3} \times (3 \times 14^2 + 3 \times 14 \times 8 + 8^2)$ [× 55]
(d)(iii)	192 000 or 192 000 to 192 200	**3**	**M2** for *their* **(d)(ii)** $\times \left(\frac{42}{28}\right)^3$ or **M1** for $\left(\frac{42}{28}\right)^3$ or $\left(\frac{28}{42}\right)^3$ OR **M2** for $\frac{\pi}{3} \times$ *their* **(c)** $\times \left(3 \times 21^2 + 3 \times (8 \times 1.5) \times 21 + (8 \times 1.5)^2\right)$ or **B1** for $a = 12$
(d)(iv)	$[h =] \frac{3V}{\pi(3r^2 + 3ar + a^2)}$	**2**	**M1** for $3V = \pi h\left(3r^2 + 3ar + a^2\right)$ or $\frac{V}{\pi\left(3r^2 + 3ar + a^2\right)} = \frac{h}{3}$ or $\pi h = \frac{3V}{3r^2 + 3ar + a^2}$

33. 0607_s18_ms_43 Q: 7

Question	Answer	Marks	Partial Marks
(a)	0.278 or 0.2781 to 0.2782	**3**	**M2** for $0.5 \times 0.6 \times 0.8 \times \sin 105 \times 1.2$ oe or **M1** for $0.5 \times 0.6 \times 0.8 \times \sin 105$
(b)	3.48 to 3.49	**5**	**M2** for $\sqrt{0.6^2 + 0.8^2 - 2 \times 0.6 \times 0.8 \times \cos 105}$ or **M1** for $0.6^2 + 0.8^2 - 2 \times 0.6 \times 0.8 \times \cos 105$ **A1** for 1.12 or 1.117... **M1** for *their* 1.117 × 1.2+ 2 × *their* area of *ABC* + 0.6 × 0.12 + 0.8 × 1.2
(c)	0.0348 to 0.0349	**3**	**FT** *their* **(b)** ÷ 100 **M2** for *their* **(b)** $\div \sqrt[3]{\frac{2170}{2.17}} \times \left(\sqrt[3]{\frac{2170}{2.17}}\right)^2$ oe or **M1** for $\frac{2170}{2.17}$ or $\frac{2.17}{2170}$ or $\left(\sqrt[3]{k}\right)^2$ implied by *their* **(b)** ÷ 1000

34. 0607_w17_ms_43 Q: 7

Question	Answer	Marks	Partial Marks
(a)	6810 or 6806 to 6808	**3**	**M2** for $\frac{1}{2} \times \frac{4}{3}\pi(15^3 - 5^3)$ or **M1** for either $[\frac{1}{2}\times]\frac{4}{3}\pi \times 15^3$ or $[\frac{1}{2}\times]\frac{4}{3}\pi \times 5^3$
(b)	2200 or 2199…	**5**	**M4** for $2 \times \pi \times 5^2 + 2 \times \pi \times 15^2 + \pi \times (15^2 - 5^2)$ or **M1** for each term

35. 0607_w16_ms_42 Q: 12

Question	Answer	Mark	Part Marks
(a) (i)	144π	2	**M1** for $\frac{2}{3} \times \pi \times 6^3$
(ii)	108π	2	**M1** for $2\pi \times 6^2 + \pi \times 6^2$ If 0 scored **SC1** for 72π
(b) (i)	12 or 11.99 to 12.01 nfww	3	**M2** for $\frac{\textit{their}(a)(i) \times 16}{\frac{4}{3}\pi}$ oe or **M1** for $\frac{4}{3} \times \pi \times r^3 = \textit{their}$(a)(i) $\times$ 16
(ii)	1 : 3 or $\frac{1}{3}$:1 cao nfww	3	**M2** for $4 \times \pi \times (\textit{their}$(b)(i)$)^2 : 16 \times \textit{their}$(a)(ii) oe or **M1** for $4 \times \pi \times (\textit{their}$(b)(i)$)^2$ or $16 \times \textit{their}$(a)(ii)

36. 0607_w16_ms_43 Q: 4

Question	Answer	Mark	Part Marks
(a) (i)	96	2	**M1** for $\frac{1}{3} \times 6 \times 6 \times 8$
(ii)	8.54 or 8.544...	2	**M1** for $8^2 + 3^2$
(b) (i)	84	3FT	**M2** for $\frac{7}{8} \times \textit{their}$ (a)(i) oe or **M1** for $96 \times (\frac{1}{2})^3$ or $\frac{1}{3} \times 3 \times 3 \times 4$ soi by 12
(ii)	122 or 121.8 to121.9	5	**M3** for $4 \times \frac{3}{4} \times \frac{1}{2} \times 6 \times \textit{their}$ (a)(ii) oe or $4 \times \frac{1}{2} \times (6 + 3) \times \frac{1}{2} \textit{their}$ (a)(ii) oe or **M2** for $\frac{3}{4} \times \frac{1}{2} \times 6 \times \textit{their}$ (a)(ii) oe or $\frac{1}{2} \times (6 + 3) \times \frac{1}{2} \textit{their}$ (a)(ii) oe or **M1** for $\frac{1}{2} \times 6 \times \textit{their}$ (a)(ii) or $\frac{1}{2} \times 3 \times \frac{1}{2} \textit{their}$ (a)(ii) and **M1** for $36 + 9 + 4 \times \textit{their}$ trapezium area oe

37. 0607_s15_ms_41 Q: 7

Qu.	Answer	Mark	Part Marks
(a)	$\frac{15}{3}\times\frac{12}{3}\times\frac{3}{3}$	1	
(b)	14.1 or 14.13 to 14.14	2	**M1** for $\frac{4}{3}\pi 1.5^3$
(c)	282 or 283 or 282.6 to 282.8	1FT	**FT** *their* **(b)** × 20
(d)	2.82×10^2 or 2.83×10^2 or $(2.826 \text{ to } 2.828) \times 10^2$	1FT	**FT** *their* **(c)** in standard form
(e)	52.20 to 52.41	2FT	**FT** answer only if less than 100 **M1** for $\frac{\textit{their}\ \textbf{(c)}}{15\times12\times3}\times100$

38. 0607_w15_ms_41 Q: 7

Question	Answer	Mark	Part Marks
(a) (i)	2512 final answer	2	**M1** for $20 \times 8 \times 2 \times 7.85$
(ii)	34.56 cao	3	**M2** for $2(20 \times 8 + 20 \times 2 + 8 \times 2) \times 0.08$ oe or **M1** for $2(20 \times 8 + 20 \times 2 + 8 \times 2)$ oe or for area × 0.08
(b)	48	2	**M1** for $8 \times 3 \times 2$ oe
(c) (i)	67	3	**M2** for $(20 \times 12 \times 4) \div \left(\frac{4}{3}\pi \times 1.5^3\right)$ or **M1** for $\left(\frac{4}{3}\pi \times 1.5^3\right)$
(ii)	12.6 or 12.7 or 12.8 or 12.62 to 12.82...	2	**M1** for $(20 \times 12 \times 4) - \textit{their}\ 67 \times \textit{their}\left(\frac{4}{3}\pi \times 1.5^3\right)$ oe must be positive
(iii)	1.44 or 1.45 or 1.444 to 1.452 cao	2	**M1** for $\frac{4}{3}\pi r^3 = \textit{their}(\textbf{ii})$ oe or better
(d)	$\frac{3}{8}$	4	**B3** for equivalent fraction or 0.375 **SC2** for answer $\frac{3}{16}$ or **M1** for $\frac{1}{3}\pi r^2 \times 3r \times 0.9$ and **M1** for $\left[\frac{1}{2}\right]\times\frac{4}{3}\pi(2r)^3 \times 0.45$

39. 0607_m21_ms_42 Q: 5

Question	Answer	Marks	Partial Marks
(a)	103 or 103.3 to 103.4	**2**	**M1** for $49^2 + 91^2$ oe
(b)	85.2 or 85.17 to 85.18	**2**	**M1** for $\frac{305}{360}\times\pi\times2\times16$
(c)	339 or 339.2 to 339.3…	**2**	**M1** for $\frac{1}{4}\times\pi\times6^2\times12$

Question	Answer	Marks	Partial Marks
(d)(i)	$(x-3)(x+1)+\frac{1}{2}(x-3)(2x+4)$ [=11]	**M1**	
	$x^2-3x+x-3$ or $\left[\frac{1}{2}\right](2x^2-6x+4x-12)$ or $x^2-3x+2x-6$	**B1**	one correct expansion seen
	At least one more line of working leading to $2x^2-3x-20=0$	**A1**	no errors or omissions
(d)(ii)	$(2x+5)(x-4)$	**2**	**M1** for $(2x+a)(x+b)$ where $ab=-20$ or $a+2b=-3$ or $2x(x-4)+5(x-4)$ or $x(2x+5)-4(2x+5)$
(d)(iii)	4 , –2.5	**1**	Strict **FT** *their* factors Dep on factors in part (ii)
(d)(iv)	12	**1**	**FT** 2 × (*their* positive root (d)(iii)) + 4

40. 0607_s21_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)	204 or 204.2...	**3**	**M2** for $\pi\times5\times\sqrt{(5^2+12^2)}$ or **M1** for $5^2 + 12^2$ (implied by 13)
(b)(i)	$\frac{r}{12-r}=\frac{5}{their13}$ oe	**M1**	$\frac{r}{13-5}=\frac{5}{12}$
	r(*their* 13) = 5(12 − r)	**M1**	**M1 dep on first M1 for** $12r = 5(13-5)$
	Completion to $r = 3.\dot{3}$ or $3\frac{1}{3}$ or $\frac{10}{3}$ or 3.333... with no errors	**A1**	
(b)(ii)	159 or 159.0 to 159.5	**3**	**M1** for $\frac{1}{3}\times\pi\times5^2\times12$ **M1** for $\frac{4}{3}\times\pi\times3.33^3$

41. 0607_s21_ms_43 Q: 4

Question	Answer	Marks	Partial Marks
(a)	990 or 989.6 to 989.7...	**5**	**M2** for $\pi\times5\times\sqrt{5^2+12^2}$ or **M1** for $\sqrt{5^2+12^2}$ implied by 13 **M1** for $2\pi\times5\times20$ **M1** for $\frac{1}{2}\times4\pi\times5^2$
(b)(i)	296	**3**	**M2** for $\frac{2050\pi}{3}\div\left(\frac{4}{3}\pi\times1.2^3\right)$ implied by final answer 296.5 to 296.6 or **M1** for $\frac{4}{3}\pi\times1.2^3$ implied by 7.24 or 7.238 to 7.239...
(b)(ii)	0.197 or 0.1972 to 0.1975	**3**	**M2** for $\left(\frac{2050\pi}{3}-their\,296\times\frac{4}{3}\times\pi\times1.2^3\right)\div\frac{2050\pi}{3}$ oe or for $\left(their\,296\times\frac{4}{3}\times\pi\times1.2^3\right)\div\frac{2050\pi}{3}\times100$ oe or **M1** for $\frac{2050\pi}{3}-their\,296\times\frac{4}{3}\times\pi\times1.2^3$ or for $\left(their\,296\times\frac{4}{3}\times\pi\times1.2^3\right)\div\frac{2050\pi}{3}$

42. 0607_w21_ms_43 Q: 10

Question	Answer	Marks	Partial Marks
(a)	1130 or 1127 to 1128	**5**	**M1** for $\pi\times16\times4^2$ **M1** for $\frac{1}{2}\times\frac{4}{3}\times\pi\times4^3$ **M1** for 12^2-4^2 or better **M1** for $\frac{1}{3}\times\pi\times4^2\times$*their h*
(b)	$2\times\pi\times16\times4$	**M1**	
	$\frac{1}{2}\times4\times\pi\times4^2$ oe	**M1**	
	$\pi\times12\times4$	**M1**	
	$32\pi+128\pi+48\pi$ [=208π]	**B1**	
(c)	6	**3**	**M2** for $\sqrt{\frac{468}{208}}\times4$ oe or **M1** for $\sqrt{\frac{468}{208}}$ or $\sqrt{\frac{208}{468}}$ or $\left(\frac{4}{r}\right)^2=\frac{208\pi}{468\pi}$ oe

43. 0607_s20_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	1690 or 1687 or 1687.1 to 1687.3	**3**	**M2** for $18\times12^2-18\times\pi\times4^2$ or **M1** for either term correct
(a)(ii)	$1.69[0]\times10^3$	**1**	**FT** *their* (i)

Question	Answer	Marks	Partial Marks
(b)	1500 or 1503 to 1504	**4**	**M1** for $[4\times]18\times12$ **M1** for $[2\times](12^2-\pi\times4^2)$ **M1** for $\pi\times2\times4\times18$
(c)(i)	56.5 or 56.6 or 56.54 to 56.56	**1**	
(c)(ii)	2.38 or 2.380 to 2.382	**2**	**M1** for $\frac{3\times\textit{their}(c)}{4\times\pi}$

44. 0607_w20_ms_41 Q: 9

Question	Answer	Marks	Partial Marks
(a)(i)	4870 or 4869 to 4870	3	**M1** for $24\times16\times12$ **M1** for $\frac{1}{2}\times\frac{4}{3}\times\pi\times5^3$
(a)(ii)	1050 or 1051 to 1052 nfww	2	**M1** for $\left(\frac{3}{5}\right)^3$ oe or $\frac{1}{2}\times\frac{4}{3}\times\pi\times3^3 + 14.4\times9.6\times7.2$
(b)(i)	1810 or 1806 to 1807	3	**M1** for $24\times16\times2 + 24\times12\times2 + 16\times12\times2$ $[-\pi\times5^2]$ **M1** for $0.5\times4\times\pi\times5^2$
(b)(ii)	2600 or 2610 or 2600 to 2606. ... nfww	2	**M1** for $\left(\frac{6}{5}\right)^2$ oe soi or $0.5\times4\times\pi\times6^2 + 28.8\times19.2\times2$ $+ 28.8\times14.4\times2$ $+ 19.2\times14.4\times2 - \pi\times6^2$

45. 0607_w20_ms_43 Q: 6

Question	Answer	Marks	Partial Marks
(a)	135π	3	**M1** for $\pi\times3^2\times11$ **M1** for $\frac{4}{3}\pi\times3^3$
(b)(i)	3	2	**M1** for $\pi\times r^2\times15 =$ *their* **(a)**
(b)(ii)	2.12 or 2.120 to 2.121	2	**M1** for $20\times10\times h =$ *their* **(a)**

46. 0607_s19_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)	12 cao final answer	3	**B2** for 11.98 to 12.02 or **M1** for $\pi\times3^2\times l + 2\times\frac{2}{3}\times\pi\times3^3$ $[=144\pi]$ oe
(b)	3.53 or 3.528 to 3.529...	2	**M1** for $144\pi\times7.8$ soi by figs 353 or 3528 to 3529

Question	Answer	Marks	Partial Marks
(c)	2.95 or 2.96 or 2.950 to 2.963...	3	**M2** for $\frac{144\pi - 20\times 2.8^3}{144\pi}$[×100] or $\frac{20\times 2.8^3}{144\pi}\times 100$ oe or **M1** for $144\pi - 20\times 2.8^3$ or $\frac{20\times 2.8^3}{144\pi}$ oe
(d)	1.5 oe cao final answer	3	**B2** for 1.498 to 1.502 or **M2** for $3\times\sqrt[3]{\frac{18\pi}{144\pi}}$ oe or **M1** for $\sqrt[3]{\frac{18\pi}{144\pi}}$ or $\sqrt[3]{\frac{144\pi}{18\pi}}$ oe or better or for $\left(\frac{3}{x}\right)^3 = \frac{144\pi}{18\pi}$ oe

47. 0607_w19_ms_43 Q: 7

Question	Answer	Marks	Partial Marks
(a)(i)	134 or 134.0 to 134.1	2	**M1** for $\frac{1}{2}\times\frac{4}{3}\times\pi\times 4^3$ oe
(a)(ii)	101 or 100.5...	2	**M1** for $\frac{1}{3}\times\pi\times 4^2\times 6$ oe

Question	Answer	Marks	Partial Marks
(a)(iii)	1120 or 1117 to 1118	2	**M1** for $\frac{2}{3}\times\pi\times 4^3\times 7.85$ soi or *their* **(i)** × 7.85 or for $\frac{1}{3}\times\pi\times 4^2\times 6\times 0.65$ soi or *their* **(ii)** × 0.65
(b)	191 or 191.1 to 191.2	5	**M1** for $6^2 + 4^2$ **A1** for 7.21 or 7.211... or $\sqrt{52}$ **M1** for $\pi\times 4\times$ *their* 7.21 **M1** for $2\times\pi\times 4^2$
(c)	430 or 429.7 to 430.2	2	**FT** *their* **(b)** **M1** for *their* **(b)** × $\left(\frac{9}{6}\right)^2$ oe

48. 0607_w18_ms_42 Q: 11

Question	Answer	Marks	Partial Marks
(a)	46.8 or 46.82 to 46.83	**3**	**M1** for $\frac{1}{2} \times \pi \times 1.8^2 \times 8$ oe **M1** for $\frac{1}{4} \times \frac{4}{3} \times \pi \times 1.8^3$ oe
(b)	60.5 or 60.49 to 60.51...	**4**	**M1** for $\frac{1}{2} \times \pi \times 1.8^2$ oe **M1** for $\frac{1}{2} \times 2 \times \pi \times 1.8 \times 8$ oe **M1** for $\frac{1}{4} \times 4 \times \pi \times 1.8^2$ oe

49. 0607_s17_ms_43 Q: 5

Question	Answer	Marks	Part Marks
(a)	804 or 804.2 to 804.4	**3**	**M1** for $\frac{1}{3}\pi \times 8^2 \times 16$ **M1** for $\frac{4}{3}\pi \times 4^3$
(b)	450 or 449.5 to 449.6…	**3**	**M2** for $\pi \times 8 \times \sqrt{8^2 + 16^2}$ or **M1** for $\sqrt{8^2 + 16^2}$ or $\pi \times 8 \times$ *their l*

Question	Answer	Marks	Part Marks
(c)	8.94 or 8.944…	**4**	*P* is point of contact between slant edge and circle. **B2** for $PV = 8$ nfww or **M1** for $\frac{8}{4} = \frac{16}{PV}$ oe **M1** for $OV^2 = 4^2 + PV^2$ OR **B2** for $l = \sqrt{320}$ oe or **M1** for $l^2 = 8^2 + 16^2$ **M1** for $\frac{8}{4} = \frac{l}{OV}$ soi OR *x* is semi-vertical angle of cone **M1** for $\tan x = \frac{8}{16}$ oe **M2** for $\frac{4}{\sin x}$ or **M1** for $\frac{4}{OV} = \sin x$

50. 0607_w17_ms_41 Q: 5

Question	Answer	Marks	Partial Marks
(a)	$\frac{45}{360} \times 2\pi \times 22.5 = 2\pi r$ or $\frac{45}{360} \times \pi \times 22.5^2 = \pi \times r \times 22.5$	**M2**	or **M1** for $\frac{45}{360} \times 2\pi \times 22.5$ or $\frac{45}{360} \times \pi \times 22.5^2$
	2.812 to 2.813	**A1**	
(b)	241 or 240.7 to 241.0...	**5**	**M3** for $\frac{45}{360} \times \pi\,(32.5^2 - 22.5^2)$ oe or **M2** for $\frac{45}{360} \times \pi \times 32.5^2$ or $\frac{45}{360} \times \pi \times 22.5^2$ and **M1** for $\pi \times 2.81^2$
(c)	963 or 964 or 962.8 to 963.6	**2**	**FT** *their* (b) × 4 **B1** for length scale factor = 2, $\sqrt[3]{8}$, $\frac{1}{2}$ soi, or area factor = 2^2 oe

51. 0607_s16_ms_41 Q: 4

Question	Answer	Mark	Part Marks
(a)	66 000 or 65 970 to 65 982	**4**	**M1** for $\frac{4}{3} \times \pi \times 15^3$ **M1** for $\pi \times 15^2 \times 40$ **M1** for $\pi \times 25^2 \times 12$
(b) (i)	16.4	**1**	
(ii)	120	**3**	**M2** for $15000 \div 5^3$ oe or **M1** for 5^3 or $(\frac{1}{5})^3$ seen

52. 0607_s16_ms_42 Q: 7

Question	Answer	Mark	Part Marks
(a) (i)	576 or 575.8 to 576.0…	**3**	**M1** for $\frac{2}{3}\pi \times 5^3$ (262 or 261.7 to 261.8…) **M1** for $\frac{1}{3}\pi \times 5^2 \times 12$ (314 or 314.1 to 314.2)
(ii)	0.547 or 0.5470 to 0.5472	**2FT**	**FT** *their* (a)(i) **M1** for *their* (a)(i) × 0.95 ÷ 1000
(iii)	1827 or 1828	**2FT**	**FT** with consistent units usual accuracy and truncated **M1** for 1000 ÷ *their* (a)(ii)

Question	Answer	Mark	Part Marks
(iv)	361 or 361.2 to 361.3…	4	**M1** for $2\pi \times 5^2$ (157 or 157.0 to 157.1) **M2** for $\pi \times 5 \times \sqrt{5^2+12^2}$ (204 or 204.2…) or **M1** for $\sqrt{5^2+12^2}$ (13)
(b)	5.37 or 5.369…	5	**M4** for $\sqrt{\dfrac{377}{\pi(1+\sqrt{10})}}$ or **M3** for $\dfrac{377}{\pi(1+\sqrt{10})}$ or **M2** for $\pi r^2 + \pi r\left(\sqrt{(3r)^2+r^2}\right) = 377$ or **M1** for $r^2 + (3r)^2$ oe

53. 0607_w16_ms_41 Q: 4

Qu.	Answer	Mark	Part Marks
(a)	$\dfrac{\frac{2}{3}\pi \times 9^3}{\frac{1}{3}\pi \times 9^2}$ or equation with parts clearly cancelled leaving 2 and 9	M2	**M1** for $\frac{1}{3}\pi \times 9^2 \times h = \frac{2}{3}\pi \times 9^3$ oe
(b) (i)	763 or 764 or 763.4 to 763.5…	2	**M1** for $\pi \times 9^2 + 2\pi \times 9^2$ or **SC1** for 509 or 508.9 to 509.0… or 162π
(ii)	569 or 569.0 to 569.1	3	**M2** for $\pi \times 9 \times \sqrt{9^2+18^2}$ or **M1** for 9^2+18^2
(c)	45	3	**M2** for $\dfrac{\frac{2}{3}\pi \times 9^3}{\frac{4}{3}\pi \times 2^3}$ or equation with parts clearly cancelled (implied by 45.56 to 46) or **M1** for $\frac{4}{3}\pi \times 2^3 \times n = \frac{2}{3}\pi \times 9^3$

54. 0607_s15_ms_43 Q: 9

Qu.	Answer	Mark	Part Marks
(a) (i)	$\frac{x}{x+40}=\frac{15}{20}$ oe	1	
	$20x = 15x + 40 \times 15$ oe	1	Accept 600 for 40×15
(ii)	121 or 120.9… or $15\sqrt{65}$	2	**M1** for $\sqrt{120^2+15^2}$
(iii)	40.3 or 40.24 to 40.35 or $5\sqrt{65}$	2FT	**M1** for *their* **(a)(i)** $\times \frac{40}{120}$ oe

Qu.	Answer	Mark	Part Marks
(b) (i)	38 700 or 38 740 to 38 752	3	**M2** for $\frac{1}{3}\pi\times20^2\times160-\frac{1}{3}\pi\times15^2\times120$ oe or **M1** for either $\frac{1}{3}\pi\times20^2\times160$ or $\frac{1}{3}\pi\times15^2\times120$
(ii)	5140 or 5139 to 5142	4	**M3FT** for $\pi \times 20 \times$ (*their* **(a)(ii)** + *their***(a)(iii)**) $-\pi \times 15\times$ (*their***(a)(ii)**) $+\pi \times 15^2$ or **M2FT** for $\pi \times 20 \times$ (*their* **(a)(ii)** + *their***(a)(iii)**) $-\pi \times 15\times$ (*their***(a)(ii)**) or **M1** for for $\pi \times 20 \times$ (*their* **(a)(ii)** + *their***(a)(iii)**) or $\pi \times 15\times$ (*their***(a)(ii)**)

55. 0607_w15_ms_43 Q: 6

Question	Answer	Mark	Part Marks
(a)	6280 or 6283 to 6284	**3**	**M2** for $\frac{2}{3}\times\pi\times10^2\times30$ oe or **M1** for $\left[\frac{1}{3}\right]\pi\times10^2\times30\ (1000\pi)$
(b) (i)	$\frac{1}{3}\times\pi\times10^2\times30-\frac{1}{3}\times\pi\times5^2\times15$ oe	**M3**	Allow use of *their* volume of cone from **(a)** or $\frac{7}{8}\times\frac{1}{3}\times\pi\times10^2\times30$ or $\frac{7}{8}$ *their* volume of cone from **(a)** **M2** for $\frac{1}{3}\times\pi\times5^2\times15$ oe or **B1** for radius of small cone = 5
	2748.8 to 2749.3	**A1**	**not 2749 alone**
(ii)	1.96 or 1.963 to 1.964	**3**	**B2** for 1960 or 1963 to 1964 or **M1** for $\pi\times10^2\times15-2749$ **M1** for correctly converting *their* volume in cc to litres.