



Topical Worksheets for Cambridge O LEVEL Mathematics D (4024)

Mensuration

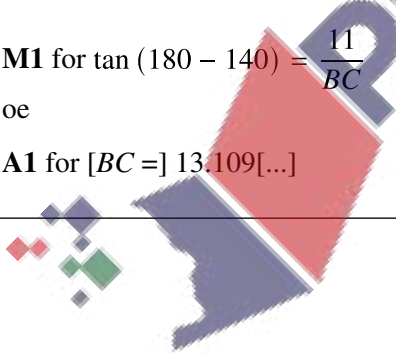
Mark Scheme

1st edition, for examination until 2025

Question	Answer	Marks	AO Element	Notes	Guidance
1	70.2π	2		M1 for $\frac{1}{3} [\pi] \times 4.5^2 \times 10.4$	
2	86	2		M1 for correct method to find the perimeter e.g. $(8 + 3) \times 2 \times 5 - 3 \times 8$ If 0 scored, SC1 for answer 98	
3	45	2		M1 for $\frac{11+7}{2} \times 5$ oe	
4	5300	1			
5	141 or 141.3 to 141.4	4		M1 for $[2 \times] \pi \times 3^2$ M2 for $2 \times \pi \times 3 \times 4.5$ or M1 for $2 \times \pi \times 3 [\times 4.5]$	
6	3.7[0] or 3.689 to 3.699...	3		M2 for $\frac{19.02}{2 + \pi}$ or M1 for $2r + \pi r [= 19.02]$ oe	

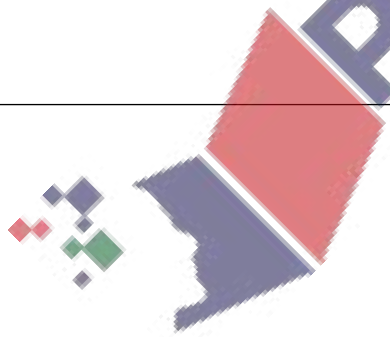
Question	Answer	Marks	AO Element	Notes	Guidance
7	25.6 or 25.59 to 25.60...	4		<p>M3 for $\frac{6.4}{2 \times \pi \times 8} \times \pi \times 8^2$</p> <p>or M2 for $\frac{x}{360} = \frac{6.4}{2 \times \pi \times 8}$ oe</p> <p>or M1 for $\frac{x}{360} \times 2 \times \pi \times 8 = 6.4$ oe</p>	
8	208	1			
9	15.5 or 15.48 to 15.49	3		<p>B2 for 1550 or 1548 to 1549</p> <p>or M2 for $\frac{42}{360} \times \pi \times 6.5^2$</p> <p>or M1 for $\frac{42}{360} \times \pi \times 65^2$</p>	
10(a)	Equilateral	1			
10(b)(i)	4.1 to 4.5	1			
10(b)(ii)	10.25 to 11.25	2		<p>M1 for $0.5 \times 5 \times \textit{their}$ (b)(i)</p>	

Question	Answer	Marks	AO Element	Notes	Guidance
10(b)(iii)	61.5 to 67.5	2		FT <i>their (b)(ii)</i> B1 for 6 seen	
11(a)	Tangent	1			
11(b)(i)	22π final answer	2		M1 for $2 \times 11 \times \pi$	
11(b)(ii)	40	2		B1 for angle $OBC = 40^\circ$ or angle $BOG = 140^\circ$	
11(b)(iii)	7.68 or 7.679 to 7.680....	2		FT <i>their (b)(ii) and (b)(i)</i> M1 for $\frac{\textit{their (b)(ii)}}{360}$ $\times \textit{their (b)(i)}$	
11(c)(i)	Angle [between] tangent [and] radius	1			
11(c)(ii)	B1 for $180 - 140$ or $90 - \textit{their (b)(ii)}$ M1 for $\tan(180 - 140) = \frac{11}{BC}$ oe A1 for $[BC =] 13.109[...]$	3			



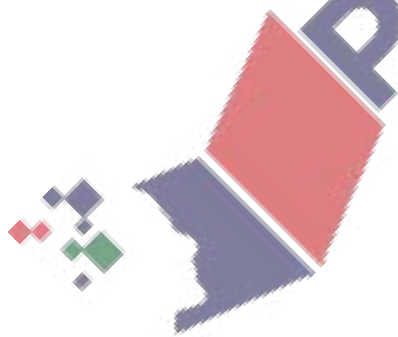
Question	Answer	Marks	AO Element	Notes	Guidance
11(c)(iii)	6.11 or 6.112 to 6.114	3		<p>M1 for $[OB^2 =] 13.11^2 + 11^2$</p> <p>A1 for 17.1 or 17.11 or 17.112 to 17.114</p> <p>OR</p> <p>M1 for $\frac{11}{\sin 40}$ oe</p> <p>A1 for 17.1 or 17.11... or 17.112 to 17.113</p>	
12	8	3		<p>M1 for $384 \div 6$</p> <p>M1dep for $\sqrt{\text{their } 64}$</p>	
13	168	3		<p>M2 for $(7 \times 4 \div 2) \times 12$ oe</p> <p>or M1 for $(7 \times 4 \div 2)$ or <i>their</i> area $\times 12$</p>	
14(a)	28	1			
14(b)	192	2		<p>M1 for $\frac{8}{0.5} \times \frac{16}{0.5}$ oe</p> <p>or B1 for 16 and 12 or 4 tiles = 1 m^2 soi</p>	
15(a)	Cuboid	1			

Question	Answer	Marks	AO Element	Notes	Guidance
15(b)	10	2		M1 for 5×2 [$\times 1$]	
16(a)	$(-1, -2)$	1			
16(b)	$\begin{pmatrix} 6 \\ 0 \end{pmatrix}$	1			
16(c)	<i>C</i> marked at (3, 3)	1			
16(d)(i)	$\begin{pmatrix} 4 \\ 5 \end{pmatrix}$	1		FT <i>their</i> (b) + $\begin{pmatrix} -2 \\ 5 \end{pmatrix}$	
16(d)(ii)	\overrightarrow{AC}	1			
16(e)(i)	Correct parallelogram drawn	1		FT <i>their</i> (c) provided <i>ABCD</i> forms a parallelogram	
16(e)(ii)	30 cm ²	2		FT the area of <i>their</i> <i>ABCD</i> provided it is a parallelogram. B1 for each	

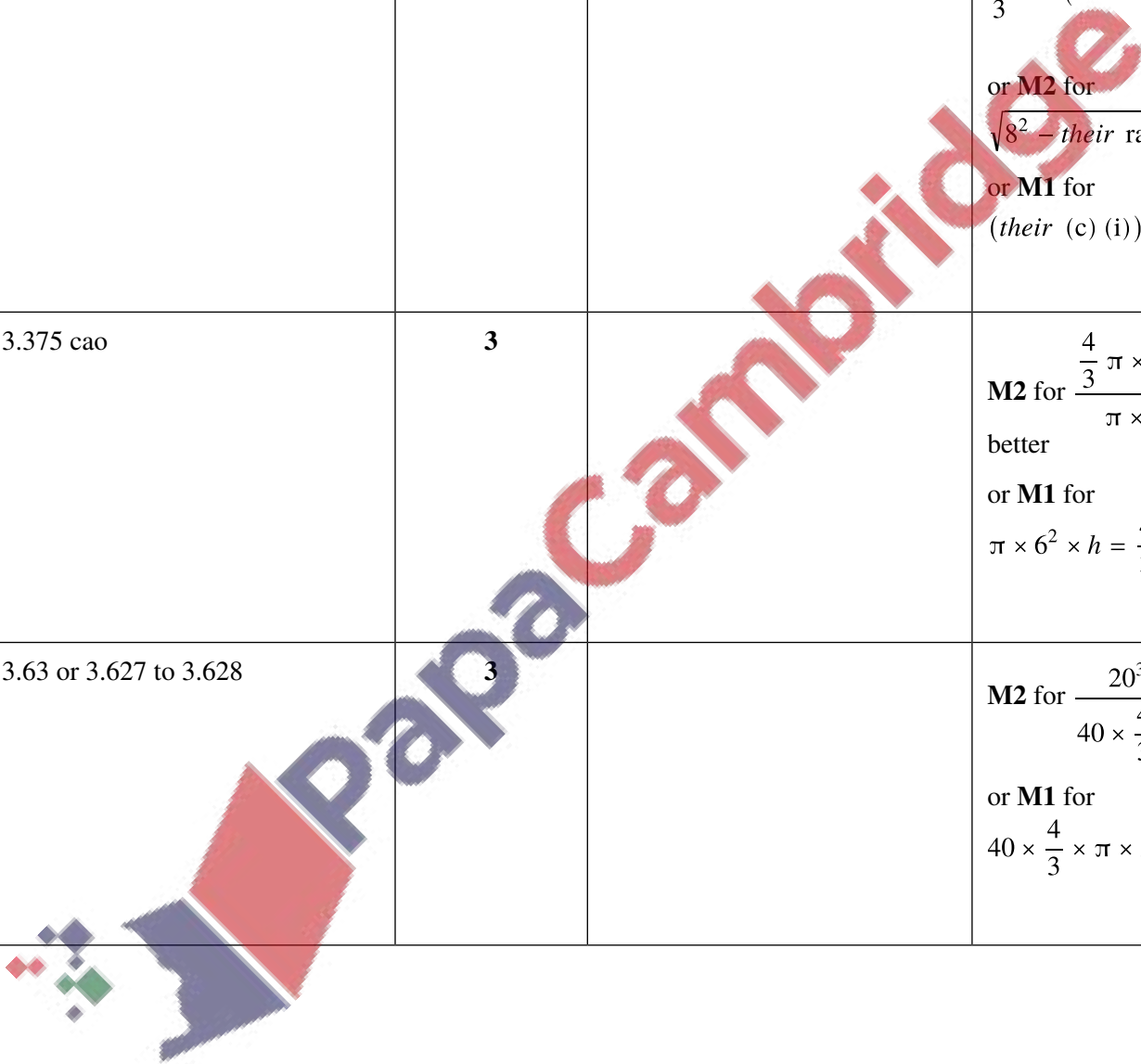


Question	Answer	Marks	AO Element	Notes	Guidance
17	41.1 or 41.09 to 41.112	5		<p>M1 for $\pi \times 6^2$</p> <p>M2 for $\frac{1}{2} \times 6 \times 6 \times 4$</p> <p>or M1 for $\frac{1}{2} \times 6 \times 6$</p> <p>M1 for $\pi \times 6^2 - \frac{1}{2} \times 6 \times 6 \times 4$</p>	
18	25	3		<p>B1 for height is 5 [cm]</p> <p>M1 for $\frac{1}{2} \times 10 \times 5$ oe</p>	
19	$9x^2$	3		<p>M2 for $\left(\frac{12x}{4}\right)^2$ oe</p> <p>or M1 for $\frac{12x}{4}$ oe</p> <p>If 0 scored, SC1 for final answer kx^2</p>	
20(a)	39[.0] or 39.03 to 39.04...	3		<p>M2 for $\frac{165}{360} \times 2 \times \pi \times 8 + 16$</p> <p>or M1 for $\frac{165}{360} \times 2 \times \pi \times 8$</p>	

Question	Answer	Marks	AO Element	Notes	Guidance
20(b)	2.71 or 2.708...	4		<p>M3 for $\sqrt{\frac{165}{360} [\times \pi] \times 8^2}$ $\frac{4 [\times \pi]}$</p> <p>oe</p> <p>or M2 for $\frac{165}{360} [\times \pi] \times 8^2$ $r^2 = \frac{4 [\times \pi]}$</p> <p>oe</p> <p>or M1 for $\frac{165}{360} \times \pi \times 8^2$</p> <p>oe seen</p>	
20(c)(i)	3.67 or 3.666 to 3.667	2		<p>M1 for $\frac{165}{360} \times 2 [\times \pi] \times 8 = 2 [\times \pi] \times r$</p> <p>or better</p> <p>or for $\frac{165}{360} [\times \pi] \times 8^2 = [\pi \times] \times r \times 8$</p> <p>or better</p>	



Question	Answer	Marks	AO Element	Notes	Guidance
20(c)(ii)	100 or 100.0 to 100.1... final answer	4		<p>M3 for $\frac{1}{3} \pi \times (\text{their (c) (i)})^2 \times \sqrt{8^2 - \text{their radius}^2}$</p> <p>or M2 for $\sqrt{8^2 - \text{their radius}^2}$</p> <p>or M1 for $(\text{their (c) (i)})^2 + h^2 = 8^2$</p>	
21	3.375 cao	3		<p>M2 for $\frac{4}{3} \pi \times 4.5^3$ or $\frac{\pi \times 6^2}{\pi \times 6^2}$ or better</p> <p>or M1 for $\pi \times 6^2 \times h = \frac{4}{3} \times \pi \times 4.5^3$</p>	
22	3.63 or 3.627 to 3.628	3		<p>M2 for $\frac{20^3}{40 \times \frac{4}{3} \pi}$</p> <p>or M1 for $40 \times \frac{4}{3} \times \pi \times r^3 = 20^3$</p>	



Question	Answer	Marks	AO Element	Notes	Guidance
23	$\frac{3x}{2}$ or $1.5x$ or $1\frac{1}{2}x$	3		<p>B2 for $4R^2 = 9x^2$ oe or better</p> <p>or M1 for</p> $4\pi R^2 = 2\pi x^2 + \pi \times 2x \times \frac{7x}{2}$	
24	2700	4		<p>M2 for $15 \times 2.5 \times 20 \times 60 \times 60$</p> <p>or M1 for $15 \times 2.5 \times 20$</p> <p>M1 for <i>their</i> volume \div 1000</p> <p>If 0 scored, SC1 for figs 27 with no working</p>	
25	576	3		<p>M2 for $[2 \times] (15 \times 4 + 12 \times 4 + 12 \times 15)$ oe</p> <p>or M1 for one correct area, 15×4 or 12×4 or 12×15</p>	
26	452 or 452.3 to 452.4...	2		M1 for $12^2 \times \pi$	
27	460	1			

Question	Answer	Marks	AO Element	Notes	Guidance
28	3500 14 000	2		B1 for each	
29	6.28 or 6.283 to 6.284	3		M2 for $\frac{45}{360} \times \pi \times 5^2$ oe and $\frac{45}{360} \times \pi \times 3^2$ oe or M1 for $\frac{45}{360} \times \pi \times 5^2$ oe or $\frac{45}{360} \times \pi \times 3^2$ oe or $\pi \times 5^2 - \pi \times 3^2$ oe	
30	2592	4		M3 for $\frac{1.2 \times 100 \times 60 \times 60 \times 6}{1000}$ oe or M2 for $1.2 \times 60 \times 60 \times 6$ oe or M1 for figs $12 \times$ figs 6 or 60×60 or correct conversion e.g. their value in $\text{cm}^3 \div 1000$ their value in $\text{m}^3 \times 1000$ 1.2×100 $6 \div 10000$	

Question	Answer	Marks	AO Element	Notes	Guidance
31(a)	Two correct lines drawn	2		B1 for one correct, no extras or two correct and one extra	
31(b)	2.16	2		M1 for 1.2×1.8	
32(a)	B2 for 40 B1 for cm^3	3		M1 for $5 \times 4 \times 2$	
32(b)	Correct net	3		B2 for 4 more correct faces in correct position B1 for 2 or 3 more correct faces in correct position	
33	384	2		M1 for $8 \times 8 [\times 6]$	
34	14.7	2		M1 for $\frac{1}{2} \times 8.4 \times 3.5$ oe	
35	436 500	1			
36	36.7[0]	1			
37	5	2		M1 for $180 \div 6^2$ oe	

Question	Answer	Marks	AO Element	Notes	Guidance
38	23.1 or 23.137 to 23.139 or 23.14	3		M2 for $\frac{9\pi}{2}$ oe or M1 for 9π	
39	40	2		M1 for $5 \times 4 \times 2$	
40	160	1			
					[Total: 138]

