Mark scheme

Arc length and sector area

Mathematics 0580 · Questions from Paper 1 and Paper 2

Total marks

37

MARKS FOR EACH QUESTION

1	2	3	4	5	6	7	8	9	10	Total
2	2	3	3	3	4	4	5	5	6	**37**

Question 1 **[2]**

1	$\frac{3}{2}\pi$, $1\frac{1}{2}\pi$, or 1.5π	**2**	**M1** for $\frac{60}{360}\times\pi\times3^2$ oe

Question 2 **[2]**

2	7.44 or 7.439 to 7.440…	**2**	**M1** for $2\times\pi\times r\times\frac{72}{360}=9.35$ oe or better

Question 3 **[3]**

3	36.8 or 36.80 to 36.81	**3**	**M1** for $\frac{26}{360}\times2\times\pi\times15$ **M1** for 2×15 + a term involving π

Question 4 **[3]**

4	71.6 or 71.61 to 71.62	**3**	**M2** for $\frac{\text{angle}}{360}=\frac{26-8-8}{2\pi\times8}$ or better or **M1** for $\frac{\text{angle}}{360}\times2\pi\times8$ oe

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Question 5 **[3]**

5	315	3	**M1** $\frac{x}{360} \times 2 \times \pi \times 8$ oe **M1** $\frac{x}{360} \times 2 \times \pi \times 8$ (+ 16) = (16 +) 14π

Question 6 **[4]**

6(a)	11.3 or 11.305 to 11.312	**2**	**M1** for $\frac{72}{360} \times 2 \times 9 \times \pi$
6(b)	50.9 or 50.89 to 50.91	**2**	**M1** for $\frac{72}{360} \times 9^2 \times \pi$

Question 7 **[4]**

7	9π	**4**	**M3** for a fully correct method e.g. $\frac{2\pi}{2\pi \times 9} \times \pi \times 9^2$ oe OR **B2** for 40 or $\frac{1}{9}$ oe or **M1** for 18 + $k \times 2 \times \pi \times 9 = 18 + 2\pi$ oe **M1** for $(their\ k) \times \pi \times 9^2$ oe OR **SC2** for answer 81 + 9π oe

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Question 8 **[5]**

8(a)	24π cao	**2**	**M1** for $\frac{60}{360}\times\pi\times12^2$ oe
8(b)	20π cao	**3**	**M2** for $\frac{360-60}{360}\times\pi\times12\times2$ oe or **M1** for $\frac{k}{360}\times\pi\times12\times2$ oe where $k < 360$

Question 9 **[5]**

9	1024 cao	**5**	**B4** for 1023 to 1024.0… or 1020 or **M3** for $\frac{125}{360}\times\pi\times48^2-\frac{125}{360}\times\pi\times40^2+32\times8$ or **M1** for $\frac{125}{360}\times\pi\times48^2$ or $\frac{125}{360}\times\pi\times40^2$ **and M1** for $32\times8+k\pi$ If B0 scored **B1** for *their* more accurate decimal answer rounded correctly to an integer

Question 10 **[6]**

10(a)	77.3 or 77.32 to 77.33…	**3**	**M2** for $\frac{360-60}{360}\times\pi\times12.4\times2$ oe $[\pm n\times12.4]$ or **M1** for angle 60° or 300° soi or for $\frac{k}{360}\times\pi\times12.4\times2$ oe $[\pm n\times12.4]$
10(b)	5.17 or 5.172 to 5.173…	**3**	**M2** for $\frac{74.5}{\pi}\times\frac{360}{360-41}=r^2$ oe or better or **M1** for $74.5=\frac{360-41}{360}\times\pi r^2$ oe or for $\sqrt{\frac{74.5}{\pi}\times\frac{360}{k}}$ oe

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