

Mixed SSM 3 ms

0 min
0 marks

1. (a) $0.5 \times 10^2 \times \sin 60$ M1
43.3 A1

(b) $\frac{60}{360} \times \pi \times 10^2$ M1,M1
or 53.3(5...)

2×(their 52.3...-their 43.3) A1
18.1...
18.2 with method

[5]

2. $\frac{12750}{2}$ M1,M1
or 637.5

$4 \times \pi \times 637.5^2$ M1
or 5 107(0??)...

28.15 oe M1

$0.2815 \times (\text{their } 5\ 107\ (0??) \dots)$ A1
or 1 437 (6??) ...

$1.43 \dots \times 10^8$ A1
or 144 000 000

[6]

3. $\frac{3600}{450}$ M1,M1

oe

$\sqrt[3]{8} \times 10$ A1

oe

20

[3]

4. $\frac{1200}{\sin 145.2} = \frac{TC}{\sin 21.5}$ M1

$$\frac{1200}{\sin 145.2} = \frac{AT}{\sin 13.3}$$

$(\frac{\sin 21.5}{\sin 145.2}) \times 1200$ or 770.6... M1,M1

$$(\frac{\sin 13.3}{\sin 145.2}) \times 1200$$
 or 483.7...

(their 770.6...) $\times \sin 13.3$ A1
 (their 483.7...) $\times \sin 21.5$

177.2(8...)

[4]

5. (a) (i) 40 B1

(ii) 140 or 180 – (their x) B1ft
Do not ft if answer = 140 in (a)(i)

(b) Logical and precise explanation B2
 (either written or as calculation)
B1 for 1 angle labelled or stated correctly, no reason

- (c) $24 \div 8 \times 2$ M1
or OP = 6
- $\pi(\text{or } 3.14) \times (\text{their } 6)^2$ M1
- 36π or $36 \times \pi$ or $\pi \times 36$ A1
allow $\pi 36$
SC2 108 to 114 or $\pi \times 9$ oe
SC1 27 to 28.5

[7]

6. (a) (i) 40 B1
- (ii) 140 or $180 - \text{their } x$ B1ft
Do not ft if answer = 140 in (a)(i)
- (b) Logical and precise explanation B2
 (Either written or as a calculation)
One angle labelled or stated correctly, no reason, B1
- (c) angle $ADB = 32^\circ$ B1
Reasons not needed in any part
Alt seg.thm.
In all parts accept angles
- angle $DBC = 32^\circ$ B1 dep
Alternate angles
marked on the diagram
- angle $BDC = 32^\circ$ B1 ft
Base angles Isos. Triangle
as 'evidence'
- angle $BCD = 116^\circ$ B1 ft
Angle sum of triangle
- angle $BAD = 64^\circ$ B1 ft
Opp. angles cyclic quad.

[9]

7. (a) (i) $BA = a - 2b$ B1
or equivalent

(ii) $MQ = MB + BA = \mathbf{b} + (\mathbf{a} - 2\mathbf{b})$ M1
*Attempt to set up a route, must include substitution of \mathbf{a} and \mathbf{b} ,
 condone one error*

$MQ = \mathbf{a} + \mathbf{b}$ or $(\mathbf{a} + \mathbf{b})$ A1
Need not be simplified

(iii) $OP = OA + AB = \mathbf{a} + (2\mathbf{b} - \mathbf{a})$ M1
 or $OP = OB + BA = 2\mathbf{b} + (\mathbf{a} - 2\mathbf{b})$

$OP = \mathbf{a} + \mathbf{b}$ A1
M1 as above, need not be simplified for A1

(b) $OP = 2 \times MQ$ B1

Trapezium B1
only if accompanied by a sound reason

[7]

8. (a) $\frac{3}{4} \times (2 \times \pi \times 12)$ M1

18π A1
*Not $\pi 18$, unless notation previously penalised
 $\pi \times 18$ is acceptable*

(b) $2 \times \pi \times r = \text{their } 18\pi$ M1
Or their $18\pi \div 2\pi$

$r = 9$ A1ft
 $r = \frac{3}{4}$ of 12 = 9 scores 2 marks

[4]

9. (a) Attempt at translation of 45° to the right M1

$P = (135, 1)$ A1

(b) Attempt at sine curve of twice the amplitude of the original M1

$P = (90, 2)$ A1

[4]

10. Scale factor = $9 \div 6 = 1.5$ M1
*Accept 9/6 or
6/9 or 4/6 or 6/4
or ratios*

$$\frac{4}{4+x} = \frac{6}{9} \quad \text{or} \quad \frac{4+x}{4} = \frac{9}{6}$$

AB = $4 \times 1.5 (= 6)$ M1
Correct use of their scale factor
 $36 = 24 + 6x$
or equiv

BD = their AB - 4 = 2 A1cao

[3]