

Circles

① a)



$$r = 0.75$$

$$C = 2\pi r = 4.71 \quad (3 \text{ sf})$$

b)

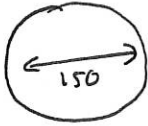
$$\frac{1000}{4.71\dots}$$

$$= 212.20\dots$$

$$=$$

$$212 \text{ complete turns}$$

② a)



$$r = 75$$

$$C = 2\pi r = 471.23\dots = 471 \text{ (nearest metre)}$$

b)

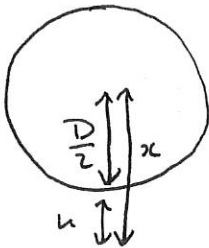
$$Spd = \frac{471 \text{ m}}{30 \text{ mins}}$$

$$= 15.707\dots \frac{\text{m}}{\text{min}}$$

$$=$$

$$0.2617\dots \frac{\text{m}}{\text{s}} = 0.262 \text{ (3sf)}$$

c)



$$h = x - \frac{D}{2}$$

③



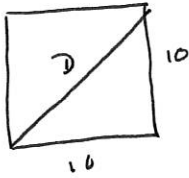
$$r = 3.8$$

$$C = 2 \times \pi \times 3.8$$

$$= 23.876\dots$$

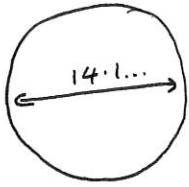
$$= 23.9 \text{ (3sf)}$$

4



$$D^2 = 10^2 + 10^2$$

$$\Rightarrow D = 14.142\dots$$



$$r = 7.07\dots$$

$$C = 2\pi r = 2 \times \pi \times 7.07\dots = 44.4288\dots$$

$$= 44.4 \text{ (3sf)}$$

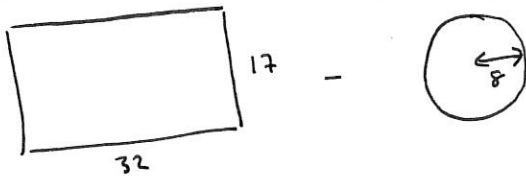
5



$$= \frac{1}{2} (\pi \times 36.6^2) + 85 \times 73.2 + \frac{1}{2} (\pi \times 36.6^2) = \begin{matrix} \downarrow \downarrow \\ 10430.35\dots \end{matrix}$$

$$= 10400 \text{ (3sf)}$$

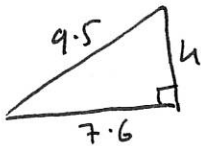
6



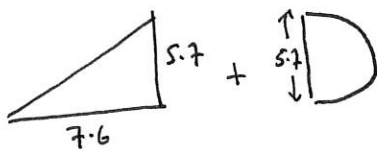
$$A_{\text{rect}} = 32 \times 17 - \pi \times 8^2 = 342.938\dots$$

$$= 343 \text{ (3sf)}$$

7



$$h^2 = 9.5^2 - 7.6^2 \Rightarrow h = 5.7$$



$$\frac{1}{2} \times 7.6 \times 5.7 + \frac{1}{2} (\pi \times 2.85^2) = 34.4187\dots$$

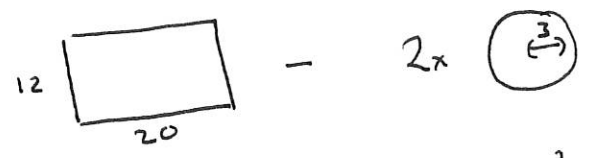
$$= 34.4 \text{ (3sf)}$$

8



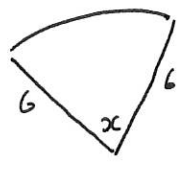
$$= \pi \times 5^2 - 3.2 \times 3.2 = 68.299... = 68.3 \text{ (3 sf)}$$

9



$$12 \times 20 - 2 \times \pi \times 3^2 = 183.45... = 183 \text{ (nearest cm}^2\text{)}$$

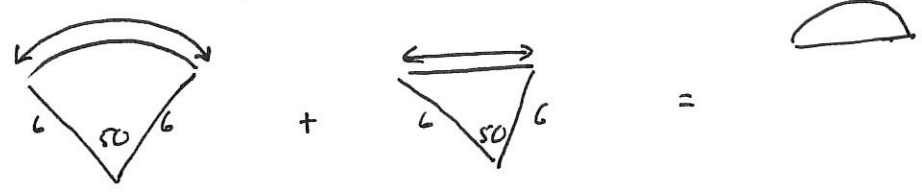
10



$$\text{Area} = \frac{x}{360} \times \pi \times 6^2 = 5\pi$$

$$\Rightarrow x \times 6^2 = 5 \times 360$$

$$\Rightarrow x = 50^\circ$$



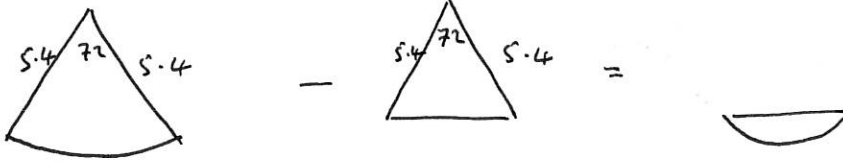
$$\frac{50}{360} \times 2 \times \pi \times 6 = 5.234...$$

$$x^2 = 6^2 + 6^2 - 2 \times 6 \times 6 \times \cos 60$$

$$x = 3.1058...$$

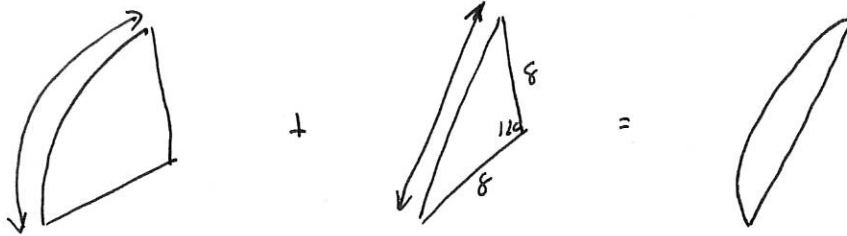
$$= 8.3417... = 8.34 \text{ (3 sf)}$$

(11)



$$\frac{72}{360} \times \pi \times 5.4^2 - \frac{1}{2} \times 5.4 \times 5.4 \times \sin 72 = 4.46 \quad (3 \text{ sf})$$

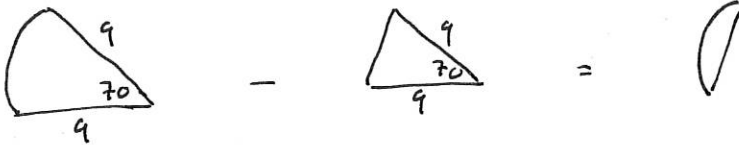
(12)



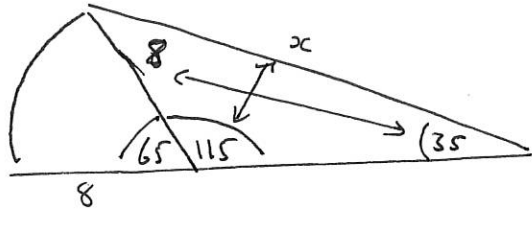
$$\frac{120}{360} \times 2 \times \pi \times 8 = 16.755\dots + \begin{cases} x \\ x^2 = 8^2 + 8^2 - 2 \times 8 \times 8 \times \cos 120 \\ x = 13.856\dots \end{cases} = 30.6$$

(13)

By circle laws angle $AOB = 70^\circ$. (Then identical to Q11)



$$\frac{70}{360} \times \pi \times 9^2 - \frac{1}{2} \times 9 \times 9 \times \sin 70 = 11.4 \quad (3 \text{ sf})$$



a) $\frac{x}{\sin(115)} = \frac{8}{\sin 35} \Rightarrow x = \sin(115) \times \frac{8}{\sin 35} \Rightarrow x = 12.6$



$\frac{65}{360} \times \pi \times 8^2 + \frac{1}{2} \times 8 \times 12.6 \times \sin 30 = 61.6$

