


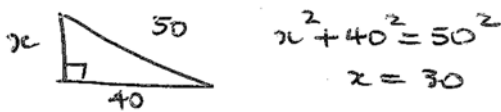
Engage Education End of Year Revision Lectures
Further Maths Geometry and Measurement Solutions

1) C - 91
 $x^\circ = 180^\circ - 89^\circ$ (alternate)
 $x = 91^\circ$ (supplementary)

2) D - 111
 Isosceles 
 $\therefore x = 180^\circ - 69^\circ$
 $\therefore x = 111^\circ$ [D]

3) A - 20cm

Radius = 50cm

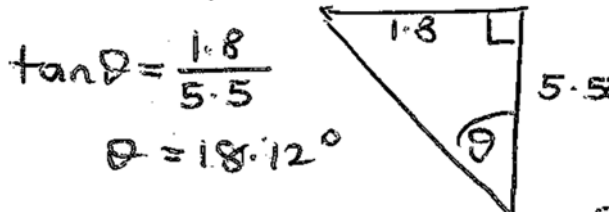


Depth = Radius - x
 $= 50 - 30$
 $= 20 \text{ cm}$ A

4) a.

$AW = \sqrt{32^2 + 12^2}$
 ≈ 34.17
 $\approx 34 \text{ cm}$

5) A - 18



6) B - 1.6cm

$C = 2\pi$

$10 = 2\pi R$

$\therefore \frac{10}{2\pi} = r$

$\therefore r \approx 1.59$

7) B - 18cm

$V = \frac{1}{3}\pi r^2 h$ (cone)

$V = \frac{\pi}{3}(30)^2(12)$

$V = 3600\pi$

$V = \pi r^2 h$ (cylinder)

$7200\pi = \pi \times 20^2 \times h$

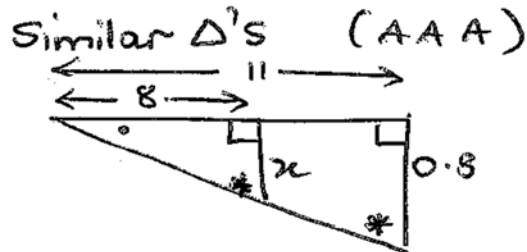
$h = 18 \text{ cm}$

8) b.

$TSA = \text{Base} + 2 \text{ sides} + 2 \text{ Front/back}$

$$\begin{aligned} \therefore TSA &= l \times w + 2(l \times w) + 2\left(\frac{b \times h}{2}\right) \\ &= 24 \times 28 + 2(34 \times 28) + 2\left(\frac{24 \times 32}{2}\right) \\ &= 3344 \text{ cm}^2 \end{aligned}$$

9) D - 1.58m



$$\frac{11}{8} = \frac{0.8}{x}$$

$$\therefore x = \frac{0.8 \times 8}{11} = 0.58$$

$$\begin{aligned} \therefore \text{Depth water} &= 1 + 0.58 \\ &= 1.58 \text{ m} \end{aligned}$$

10) D - 576 cm^2

Length A = 1.5B

\therefore Small \rightarrow Big $k > 1$
B \rightarrow A $k = 1.5$

Area Small \rightarrow Big $k^2 = 1.5^2$

$$\begin{aligned} \therefore \text{Area A} &= k^2 \times \text{Area B} \\ &= 1.5^2 \times 256 \\ &= 576 \text{ cm}^2 \end{aligned}$$

11) C - 77m

$$\frac{x}{\sin 80^\circ} = \frac{50}{\sin 40^\circ}$$

$$x \approx 76.6$$

$$x \approx 77 \text{ m}$$

12) b.

$$NT^2 = 13^2 + 10^2 - 2(10)(13) \cos 65^\circ$$

$$= 159.12$$

$$NT = \sqrt{159.12}$$

$$\approx 12.61 \text{ m}$$

13) C - 12 cm^2

$$\text{Area } \Delta = \frac{1}{2} ab \sin \theta$$

$$= \frac{1}{2} \times 6^2 \times \sin 60^\circ$$

$$= 18 \sin 60^\circ$$

$$\begin{aligned} \text{Area } \bigcirc &= \pi r^2 \\ &= \pi \times 1^2 \\ &= \pi \end{aligned}$$

$$\begin{aligned} \text{Shaded Area} &= 18 \sin 60^\circ - \pi \\ &\approx 12.44 \text{ cm}^2 \\ &\approx 12 \text{ cm}^2 \end{aligned}$$

14) D - between 180 and 270

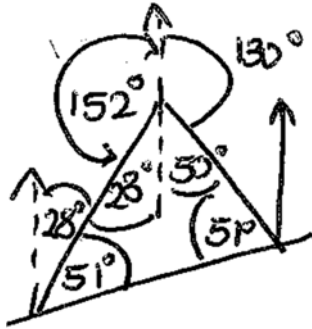
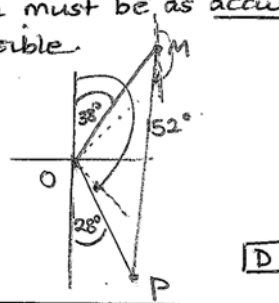


Diagram must be as accurate as possible.



- 15) a. i. 152 T
 ii. 078 T
 b. 208 T
 c. 079 T

16) a. $360/8 = 45$

b. $A = \pi r^2 \times \frac{\theta^\circ}{360} = \pi 17^2 \times \frac{45^\circ}{360} = 113.49 \text{cm}^2$

c. $A(\text{segment}) = A(\text{sector}) - A(\text{triangle}) = \left(\pi r^2 \times \frac{\theta^\circ}{360}\right) - \left(\frac{1}{2} b c \sin(\theta^\circ)\right)$
 $= \left(\pi 17^2 \times \frac{45^\circ}{360}\right) - \left(\frac{1}{2} \times 17 \times 17 \times \sin(45^\circ)\right)$
 $= 113.49 - 102.18 = 11.31 \text{cm}^2$

17) Same latitude - use $r = 6400$

$\text{arc of a circle} = 6400 \times \frac{\pi}{180} \times \theta^\circ = 6400 \times \frac{\pi}{180} \times 76^\circ = 8489.28 = 8489 \text{km}$

18) a. The equator, as the line of latitude is $0^\circ N$.

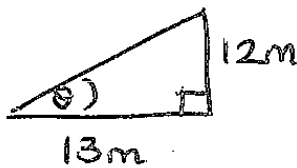
b. Same longitude - use $r = 6400 \cos(0^\circ)$

$\text{arc of a circle} = 6400 \times \frac{\pi}{180} \times 95^\circ = 10611.6 = 10612 \text{km}$

19) a. $\text{arc of a circle} = 6400 \times \frac{\pi}{180} \times 95^\circ = 10611.6 = 10612 \text{km}$

b. $95^\circ / 15^\circ = 6.333$; 6 hours and 20 minutes

20) 42.7



$$\tan \theta = \frac{12}{13}$$

$$\theta = \tan^{-1}\left(\frac{12}{13}\right)$$

$$\therefore \theta = 42.7^\circ$$

21) a. 9168 cm^2

$$v = \frac{1}{3}(l \times w)h$$

$$= \frac{1}{3}(24 \times 28) \times 32 = 7168 \text{ cm}^2$$

b. 37cm

$$AC = \sqrt{24^2 + 28^2}$$

$$= \sqrt{1360}$$

$$= 36.878$$

$$AO = \frac{1}{2} \times 36.878$$

$$= 18.439$$

$$AY = \sqrt{18.439^2 + 32^2}$$

$$= 36.93$$

$$= 37 \text{ cm}$$

c. 420 cm²

$$S = \frac{1}{2}(37 + 37 + 24) = 49$$

$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

$$= \sqrt{49(49-37)(49-37)(49-24)}$$

$$= \sqrt{176400}$$

$$= \sqrt{420^2}$$