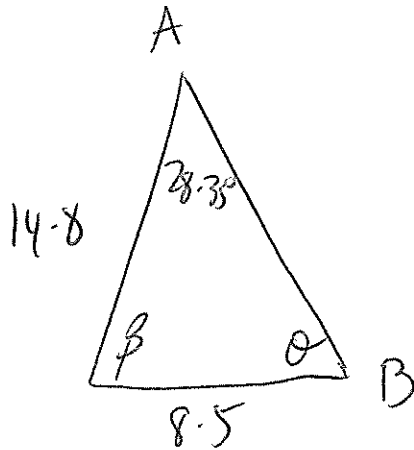


EXERCISE 13B - 4C.

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$$A = 28.35^\circ \quad a = 8.5 \quad b = 14.8$$



$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)}$$

$$\frac{8.5}{\sin 28.35} = \frac{14.8}{\sin \theta}$$

$$\sin \theta = \frac{14.8 \sin 28.35}{8.5}$$

$$\sin \theta = 0.8268$$

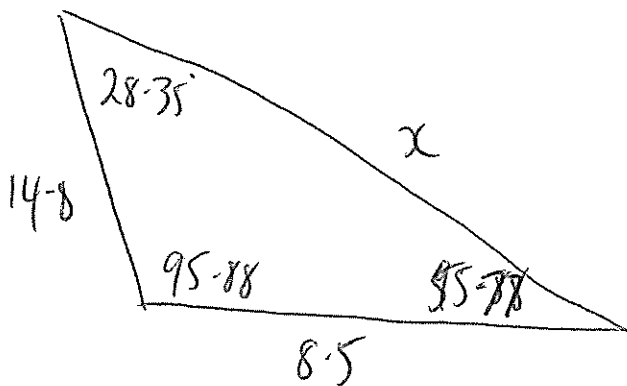
$$\theta = \sin^{-1}(0.8268)$$

$$\theta = 55.77^\circ$$

$$\therefore \beta = 180 - (28.35 + 55.77)$$

$$\beta = 95.88$$

THINKING:
~~180 - 28.35 - 55.77~~
~~180 - 84.12 = 95.88~~



$$\frac{x}{\sin(95.88)} = \frac{8.5}{\sin(28.35)}$$

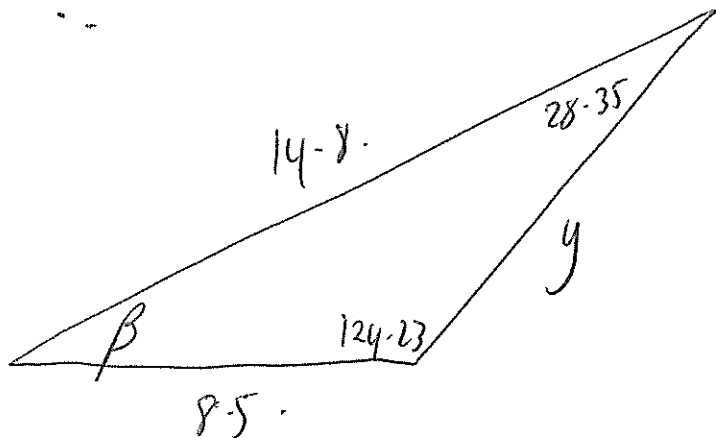
$$x = \frac{8.5 \sin(95.88)}{\sin(28.35)}$$

$$x = 17.81$$

$$\text{BUT, } \theta = 180 - 55 - 77$$

$$= \underline{124.23} \quad (\text{AMBIGUOUS CASE})$$

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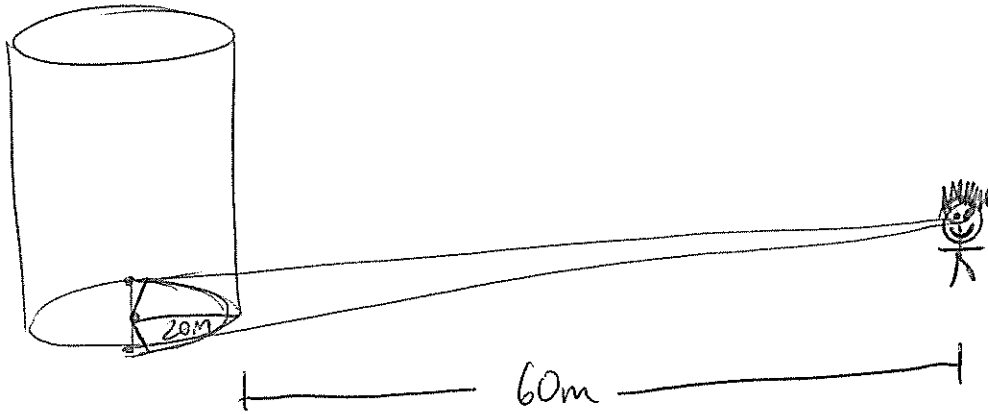
$$\therefore \beta = 180 - (124.23 + 28.35)$$
$$= \underline{27.42^\circ}$$

$$\therefore \frac{y}{\sin(27.42^\circ)} = \frac{8.5}{\sin(28.35)}$$

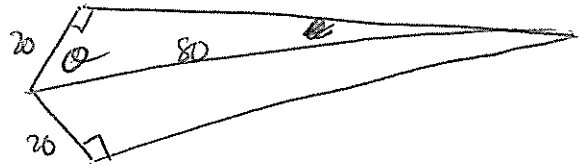
$$y = \frac{8.5 \sin(27.42)}{\sin(28.35)}$$

$$\underline{y = 8.24}$$

EXERCISE 13E - 6b



$$\begin{aligned} (a) \quad C &= 2\pi r \\ &= 2 \times \pi \times 20 \\ &= 40\pi \end{aligned}$$



$$\cos \theta = \frac{20}{80}$$

$$\theta = \cos^{-1}\left(\frac{1}{4}\right)$$

$$\theta = 75.52^\circ$$

$$\therefore 2\theta = 151.04^\circ$$

$$\text{Arc length} = \frac{\pi r \theta}{180}$$

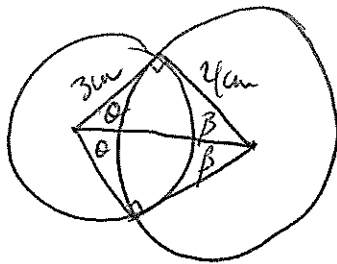
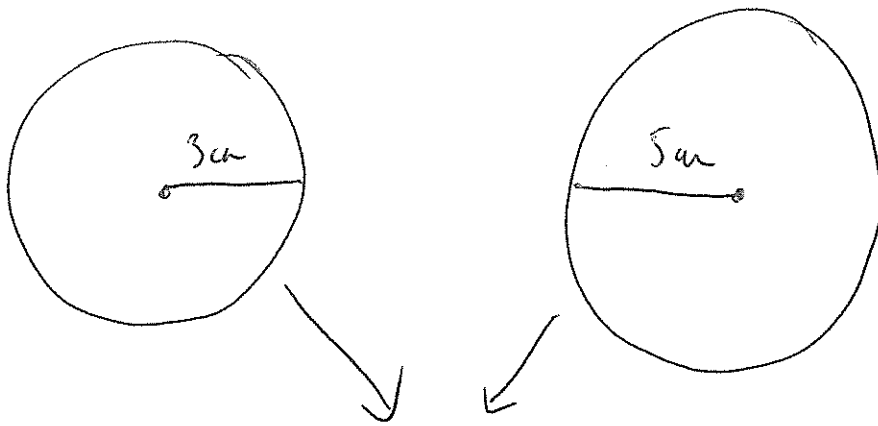
$$= \frac{\pi \times 20 \times 151.04}{180}$$

$$= 52.72 \text{ m.}$$

$$\begin{aligned} \% \text{ VISIBLE} &= \frac{52.72}{40\pi} \times 100 \\ &= 41.95\% \end{aligned}$$

$$= \underline{\underline{41.95\%}}$$

EXERCISE 13E - 8



$$\tan \theta = \frac{4}{3}$$

$$\theta = \tan^{-1}\left(\frac{4}{3}\right)$$

$$\theta = 53.13^\circ$$

$$2\theta = 106.26^\circ$$

$$2\beta = 360 - (106.26 + 180)$$

$$= 73.74^\circ$$

Area of sector 1

$$= \frac{\pi r^2 \theta}{360}$$

$$= \frac{\pi \times 3^2 \times 106.26}{360}$$

$$= 8.35 \text{ cm}^2$$

$$\text{Area of sector 2} = \frac{\pi r^2 \theta}{360}$$

$$= \frac{\pi \times 4^2 \times 73.74}{360}$$

$$= 10.296 \text{ cm}^2$$

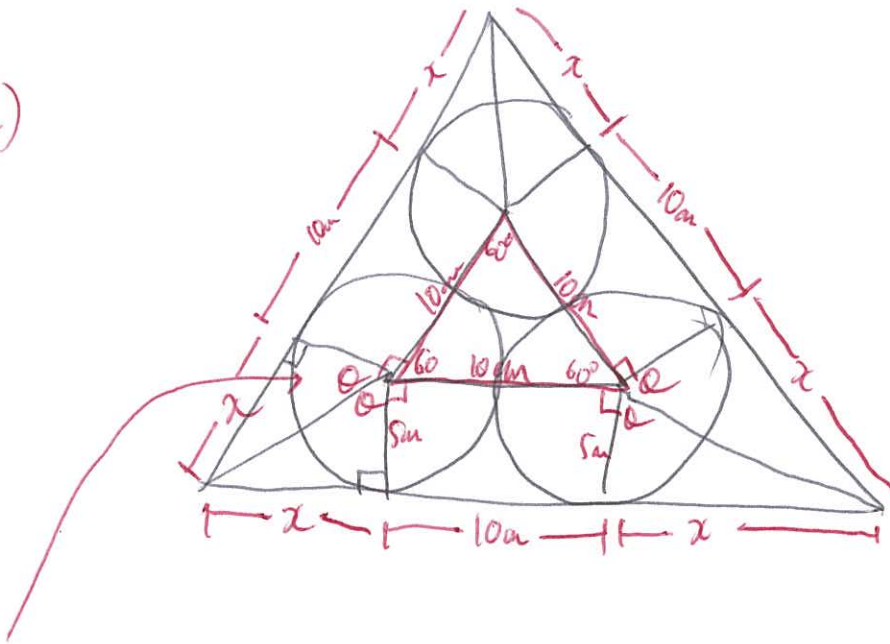
$$\begin{aligned}
 \text{Area of segment}_1 &= \frac{\pi r^2 \theta}{360} - \frac{1}{2} r^2 \sin \theta \\
 &= 8.35 - \left(\frac{1}{2} \times 3^2 \sin 106.20 \right) \\
 &= 8.35 - 4.32 \\
 &= 4.03.
 \end{aligned}$$

$$\begin{aligned}
 \text{Area of segment}_2 &= \frac{\pi r^2 \theta}{360} - \frac{1}{2} r^2 \sin \theta \\
 &= 10.296 - \left(\frac{1}{2} \times 4^2 \sin (73.74) \right) \\
 &= 10.296 - 7.68 \\
 &= 2.616
 \end{aligned}$$

$$\begin{aligned}
 \text{segment}_1 + \text{segment}_2 &= 4.03 + 2.616 \\
 &= \underline{\underline{6.64 \text{ cm}^2}}
 \end{aligned}$$

EXERCISE BE - 11

(a)

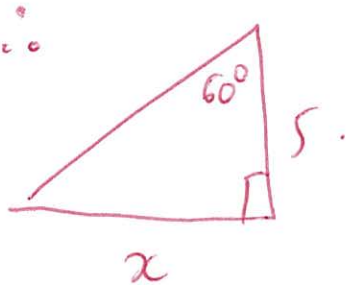


$$\theta + \theta + 90 + 90 + 60 = 360$$

$$2\theta + 240 = 360$$

$$2\theta = 120$$

$$\theta = 60^\circ$$



$$\therefore P = 30 + 6x$$

$$= 30 + 6(8.66)$$

$$= \underline{\underline{81.96 \text{ cm}}}$$

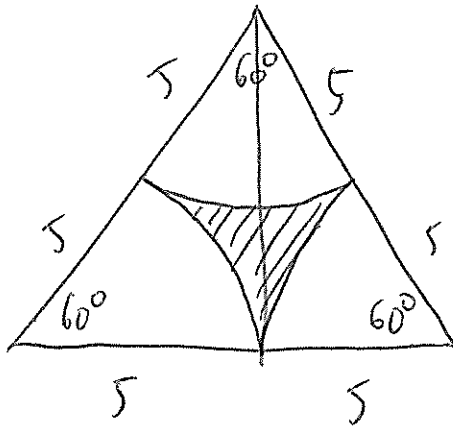
$$\tan 60 = \frac{x}{5}$$

$$x = 5 \tan 60$$

$$x = 8.66$$

INNER TRIANGLE:

(6)



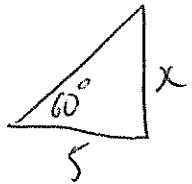
$$A_{\text{SHADED}} = A_{\text{TRIANGLE}} - 3 \times \text{SECTORS } (3 \times 60^\circ)$$

$$= A_{\text{TRIANGLE}} - A_{\text{HAF CIRCLE}}$$

$$= \left(\frac{1}{2} b h \right) - \left(\frac{\pi r^2}{2} \right)$$

A_{TRIANGLE}

height



$$= \left(\frac{1}{2} \times 10 \times 5 \tan 60 \right) - \left(\frac{\pi \times 5^2}{2} \right)$$

$$= 43.30 - 39.2699$$

$$\tan 60^\circ = \frac{x}{5}$$

$$x = 5 \tan 60^\circ$$

$$= \underline{4.03 \text{ cm}^2}$$