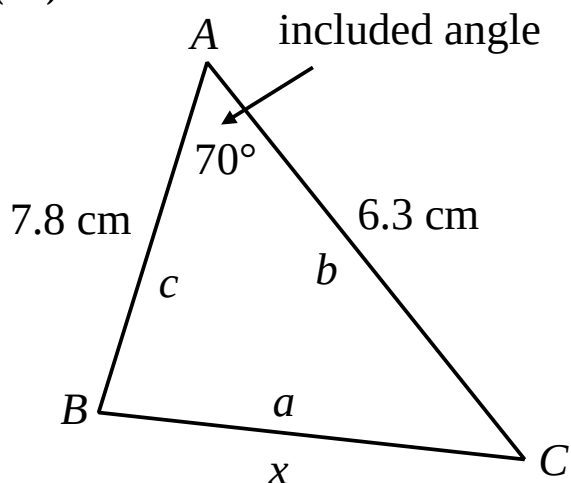


4.4 Answers

GCSE Mathematics Non-Right Angled Trigonometry

4.4.1 Solution to 4.2 Introductory Question

(i) (ii) and (iii)



(iv)

$$\begin{aligned}a^2 &= b^2 + c^2 - 2bc \cos A && \text{as given in GCSE formulae page} \\&= 6.3^2 + 7.8^2 - 2 \times 6.3 \times 7.8 \times \cos 70^\circ \\&= 66.9 \\&\therefore x = 8.18 \text{ cm}\end{aligned}$$

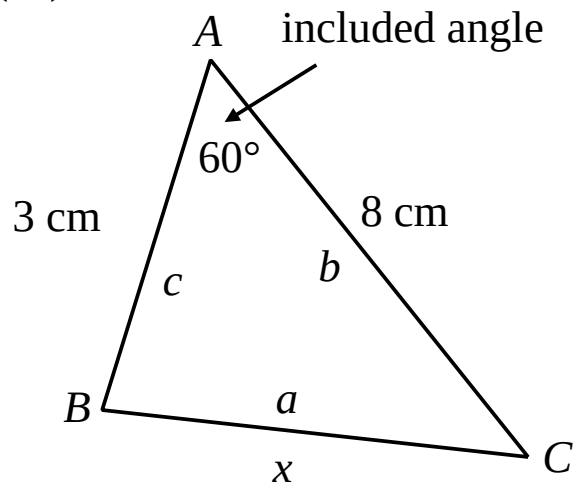
(v)

$$\begin{aligned}\text{Area } \Delta &= \frac{1}{2} a b \sin C && \text{as given in GCSE formulae page} \\&= \frac{1}{2} b c \sin A && \text{rewritten for an included angle } A \\&= \frac{1}{2} \times 6.3 \times 7.8 \times \sin 70 \\&= 23.1 \text{ cm}^2\end{aligned}$$

4.4.2 Solution to 4.3 Exercise

Answer 1

(i) (ii) and (iii)



(iv)

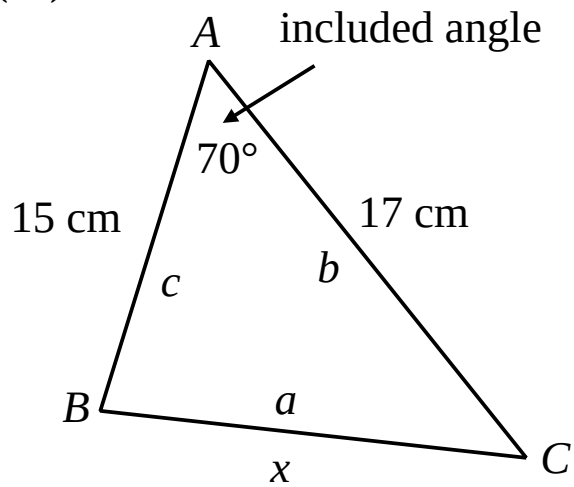
$$\begin{aligned}a^2 &= b^2 + c^2 - 2bc \cos A && \text{as given in GCSE formulae page} \\&= 8^2 + 3^2 - 2 \times 8 \times 3 \times \cos 60^\circ \\&= 49 \\&\therefore x = 7 \text{ cm}\end{aligned}$$

(v)

$$\begin{aligned}\text{Area } \Delta &= \frac{1}{2} a b \sin C && \text{as given in GCSE formulae page} \\&= \frac{1}{2} b c \sin A && \text{rewritten for an included angle } A \\&= \frac{1}{2} \times 8 \times 3 \times \sin 60 \\&= 10.4 \text{ cm}^2\end{aligned}$$

Answer 2

(i) (ii) and (iii)



(iv)

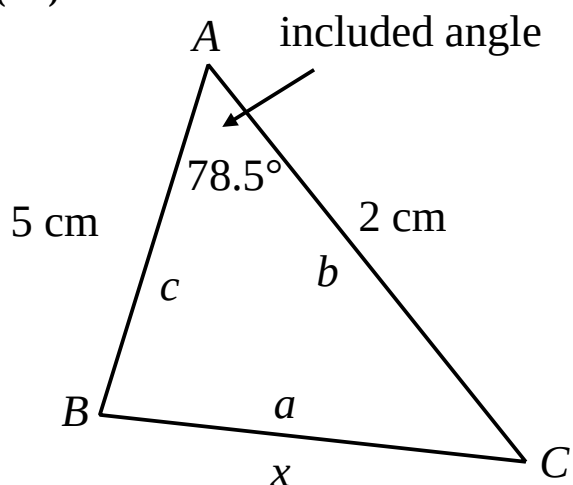
$$\begin{aligned}a^2 &= b^2 + c^2 - 2bc \cos A && \text{as given in GCSE formulae page} \\&= 17^2 + 15^2 - 2 \times 17 \times 15 \times \cos 70^\circ \\&= 339 \\&\therefore x = 18.4 \text{ cm}\end{aligned}$$

(v)

$$\begin{aligned}\text{Area } \Delta &= \frac{1}{2} ab \sin C && \text{as given in GCSE formulae page} \\&= \frac{1}{2} bc \sin A && \text{rewritten for an included angle A} \\&= \frac{1}{2} \times 17 \times 15 \times \sin 70 \\&= 120 \text{ cm}^2\end{aligned}$$

Answer 3

(i) (ii) and (iii)



(iv)

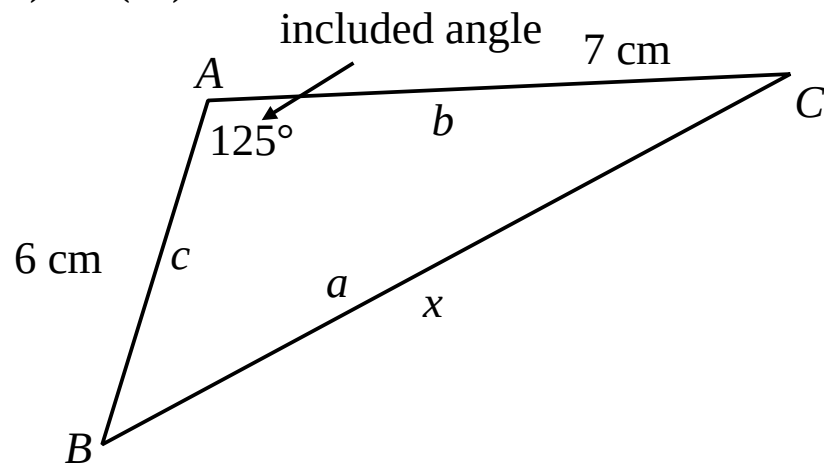
$$\begin{aligned}a^2 &= b^2 + c^2 - 2bc \cos A && \text{as given in GCSE formulae page} \\&= 2^2 + 5^2 - 2 \times 2 \times 5 \times \cos 78.5^\circ \\&= 25.0126 \\&\therefore x = 5 \text{ cm}\end{aligned}$$

(v)

$$\begin{aligned}\text{Area } \Delta &= \frac{1}{2} a b \sin C && \text{as given in GCSE formulae page} \\&= \frac{1}{2} b c \sin A && \text{rewritten for included angle A} \\&= \frac{1}{2} \times 2 \times 5 \times \sin 78.5 \\&= 4.9 \text{ cm}^2\end{aligned}$$

Answer 4

(i) (ii) and (iii)



(iv)

$$\begin{aligned}a^2 &= b^2 + c^2 - 2bc \cos A && \text{as given in GCSE formulae page} \\&= 7^2 + 6^2 - 2 \times 7 \times 6 \times \cos 125^\circ \\&= 133 \\&\therefore x = 11.5 \text{ cm}\end{aligned}$$

(v)

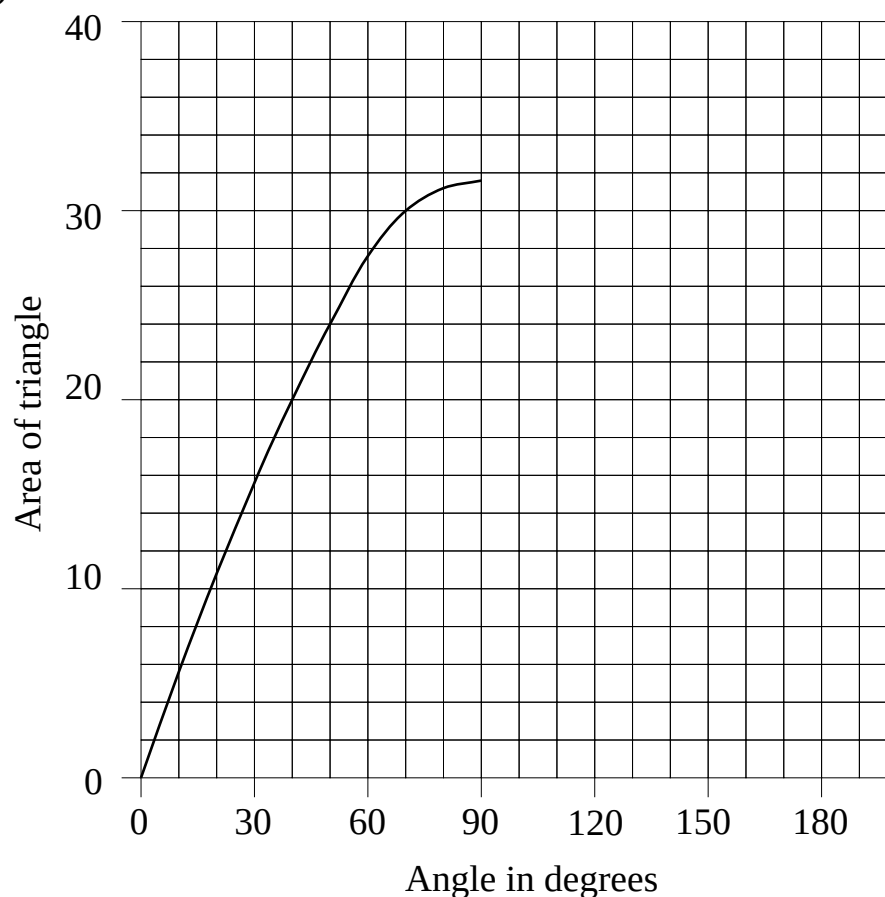
$$\begin{aligned}\text{Area } \Delta &= \frac{1}{2} a b \sin C && \text{as given in GCSE formulae page} \\&= \frac{1}{2} b c \sin A && \text{rewritten for an included angle } A \\&= \frac{1}{2} \times 7 \times 6 \times \sin 125 \\&= 17.2 \text{ cm}^2\end{aligned}$$

Answer 5

(i)

θ	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
Y	0	5.5	10.8	15.8	20.2	24.1	27.3	29.6	31.0	31.5

(ii)



(iii) The curve is symmetrical in the mirror line, $\theta = 90^\circ$