

5.5 Answers

GCSE Mathematics Non-Right Angled Trigonometry

5.5.1 Solution to Starter for Lesson 5

Answer 5.start.1

$$p^2 = t^2 + l^2 - 2tl \cos P$$

Answer 5.start.2

$$w^2 = p^2 + f^2 - 2pf \cos W$$

Answer 5.start.3

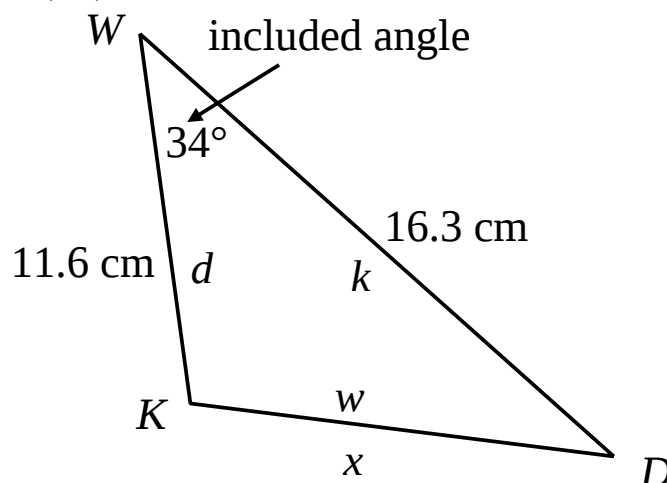
(i) $p^2 = i^2 + c^2 - 2ic \cos P$

(ii) $i^2 = p^2 + c^2 - 2pc \cos I$

(iii) $c^2 = i^2 + p^2 - 2ip \cos C$

5.5.2 Solution to 5.2 Example

(i) (ii) and (iii)



(iv)

$$\begin{aligned} w^2 &= d^2 + k^2 - 2dk \cos W \\ &= 11.6^2 + 16.3^2 - 2 \times 11.6 \times 16.3 \times \cos 34^\circ \\ &= 86.74 \\ \therefore x &= 9.31 \text{ cm} \end{aligned}$$

(v)

$$\begin{aligned} \text{Area } \Delta &= \frac{1}{2} d k \sin W \\ &= \frac{1}{2} \times 11.6 \times 16.3 \times \sin 34 \\ &= 52.9 \text{ cm}^2 \end{aligned}$$

5.5.3 Solutions to 5.3 Exercise

Answer 1

$$h^2 = m^2 + s^2 - 2ms \cos H$$

Answer 2

$$d^2 = b^2 + t^2 - 2bt \cos A$$

Answer 3

$$m^2 = a^2 + d^2 - 2ad \cos M$$

Answer 4

(i)

$$c^2 = a^2 + b^2 - 2ab \cos C$$

(ii)

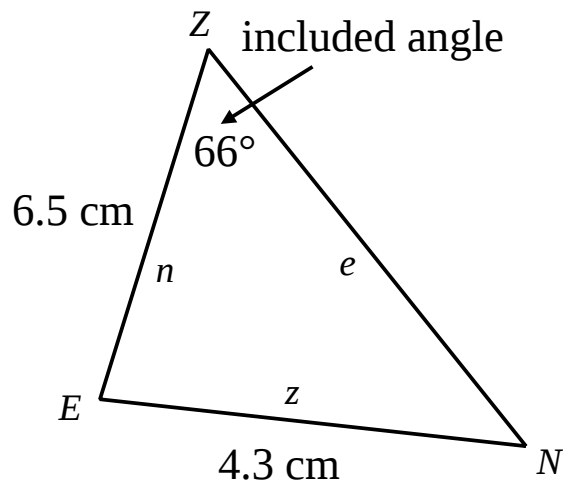
$$b^2 = a^2 + c^2 - 2ac \cos B$$

(iii)

$$a^2 = b^2 + c^2 - 2bc \cos A$$

Answer 5

(i)



(ii) and (iii)

$$\begin{aligned} e^2 &= z^2 + n^2 - 2zn \cos E \\ &= 4.3^2 + 6.5^2 - 2 \times 4.3 \times 6.5 \times \cos 66 \\ &= 38 \end{aligned}$$

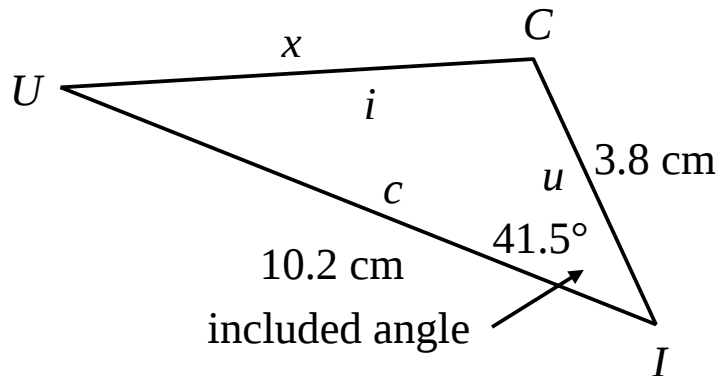
$$e = 6.16 \text{ cm (2 decimal places asked for)}$$

(iv)

$$\begin{aligned} \text{Area } \Delta &= \frac{1}{2} zn \sin E \\ &= \frac{1}{2} \times 4.3 \times 6.5 \times \sin 66 \\ &= 12.77 \text{ cm}^2 \text{ (2 decimal places asked for)} \end{aligned}$$

Answer 6

(i)



(ii) and (iii)

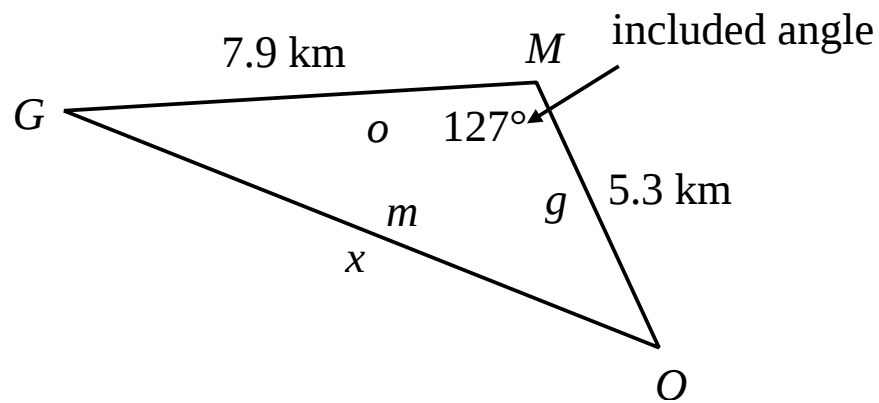
$$\begin{aligned} i^2 &= c^2 + u^2 - 2cu \cos I \\ &= 10.2^2 + 3.8^2 - 2 \times 10.2 \times 3.8 \times \cos 41.5 \\ &= 60.42 \\ i &= 7.77 \text{ cm} \end{aligned}$$

(iv)

$$\begin{aligned} \text{Area } \Delta &= \frac{1}{2} cu \sin I \\ &= \frac{1}{2} \times 10.2 \times 3.8 \times \sin 41.5 \\ &= 12.84 \text{ cm}^2 \end{aligned}$$

Answer 7

(i)



(ii) and (iii)

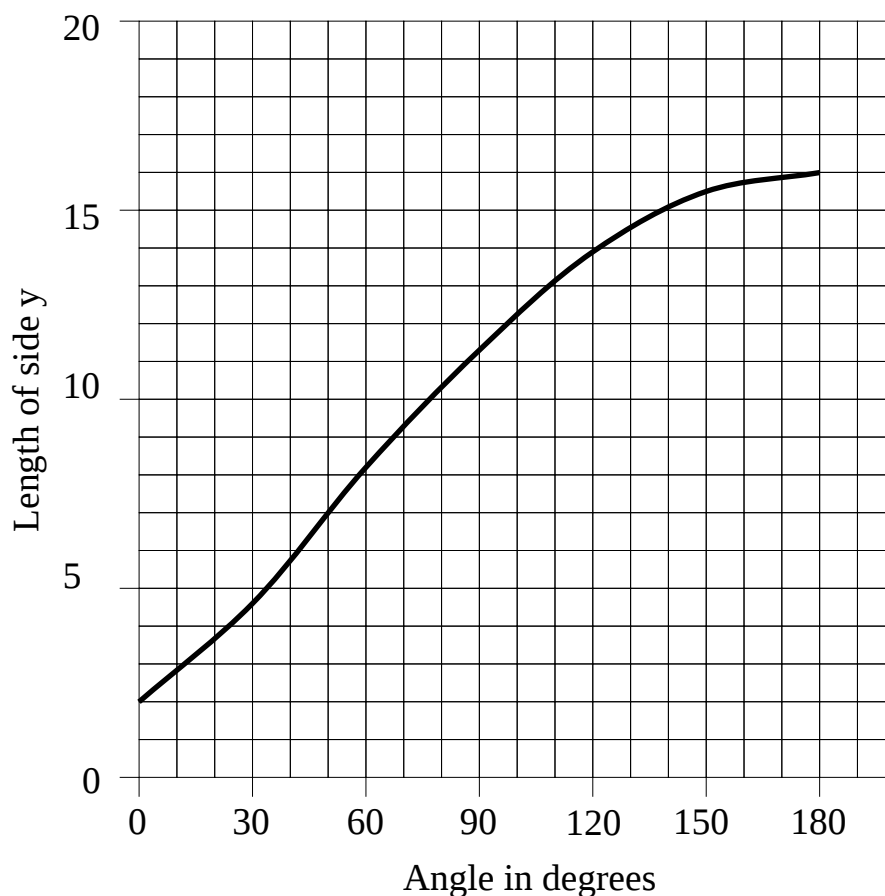
$$\begin{aligned} m^2 &= o^2 + g^2 - 2og \cos M \\ &= 7.9^2 + 5.3^2 - 2 \times 7.9 \times 5.3 \times \cos 127 \\ &= 140.9 \\ m &= 11.87 \text{ km} \end{aligned}$$

(iv)

$$\begin{aligned} \text{Area } \Delta &= \frac{1}{2} og \sin M \\ &= \frac{1}{2} \times 7.9 \times 5.3 \times \sin 127 \\ &= 16.72 \text{ km}^2 \end{aligned}$$

Answer 8**(i)**

θ	0°	30°	60°	90°	120°	150°	180°
y	2.00	4.57	8.19	11.4	13.9	15.5	16

(ii)**(iii)** The curve is symmetrical in the mirror line, $\theta = 180^\circ$