

1.

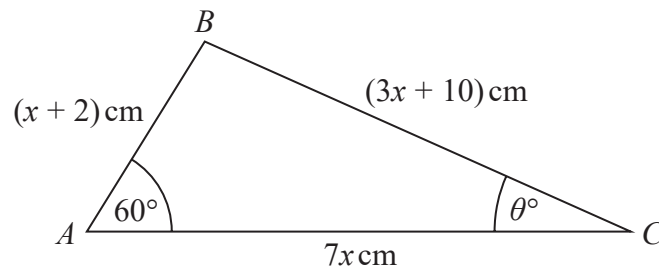
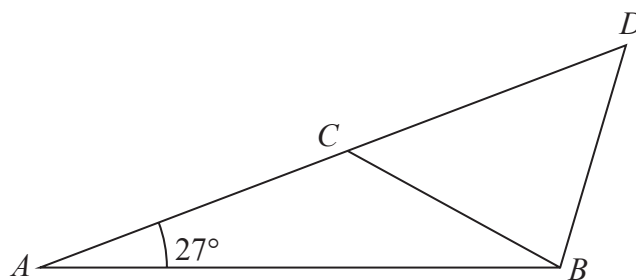


Figure 1

Figure 1 shows a sketch of triangle ABC with $AB = (x + 2)$ cm, $BC = (3x + 10)$ cm, $AC = 7x$ cm, angle $BAC = 60^\circ$ and angle $ACB = \theta^\circ$

- (a) (i) Show that $17x^2 - 35x - 48 = 0$ (3)
- (ii) Hence find the value of x . (1)
- (b) Hence find the value of θ giving your answer to one decimal place. (2)

2.



Not to scale

Figure 1

Figure 1 shows the design for a structure used to support a roof.

The structure consists of four steel beams, AB , BD , BC and AD .

Given $AB = 12\text{ m}$, $BC = BD = 7\text{ m}$ and angle $BAC = 27^\circ$

- (a) find, to one decimal place, the size of angle ACB .

(3)

The steel beams can only be bought in whole metre lengths.

- (b) Find the minimum length of steel that needs to be bought to make the complete structure.

(3)

3

A parallelogram $PQRS$ has area 50 cm^2

Given

- PQ has length 14 cm
- QR has length 7 cm
- angle SPQ is obtuse

find

- (a) the size of angle SPQ , in degrees, to 2 decimal places,

- (b) the length of the diagonal SQ , in cm, to one decimal place. (2)

4.

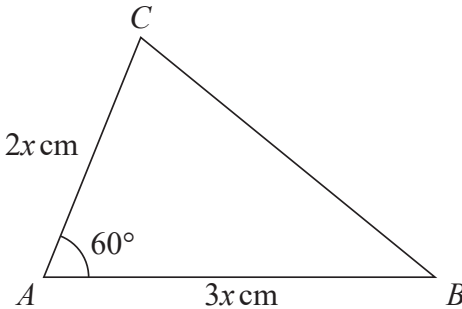


Figure 1

Figure 1 shows a sketch of a triangle ABC with $AB = 3x$ cm, $AC = 2x$ cm and angle $CAB = 60^\circ$

Given that the area of triangle ABC is $18\sqrt{3}$ cm²

(a) show that $x = 2\sqrt{3}$

(3)

(b) Hence find the exact length of BC , giving your answer as a simplified surd.

(3)

5

In a triangle ABC , side AB has length 10 cm, side AC has length 5 cm, and angle $BAC = \theta$ where θ is measured in degrees. The area of triangle ABC is 15 cm^2

(a) Find the two possible values of $\cos \theta$

(4)

Given that BC is the longest side of the triangle,

(b) find the exact length of BC .

(2)