1. A parallelogram $PQRS$ has area $50\,\text{cm}^2$

Given

- PQ has length $14\,\text{cm}$
- QR has length $7\,\text{cm}$
- angle SPQ is obtuse

find

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

(3)

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

(2)

2.

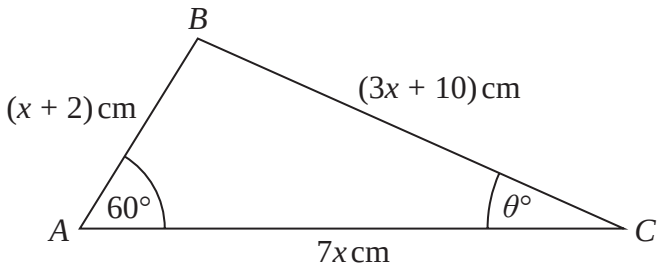

Figure 1

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

(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)

3.

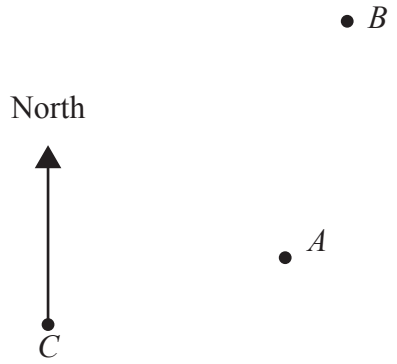

Figure 1

Figure 1 is a sketch showing the position of three phone masts, A, B and C.

The masts are identical and their bases are assumed to lie in the same horizontal plane.

From mast C

- mast A is 8.2 km away on a bearing of 072°
- mast B is 15.6 km away on a bearing of 039°

(a) Find the distance between masts A and B, giving your answer in km to one decimal place.

(3)

An engineer needs to travel from mast A to mast B.

(b) Give a reason why the answer to part (a) is unlikely to be an accurate value for the distance the engineer travels.

(1)

4.

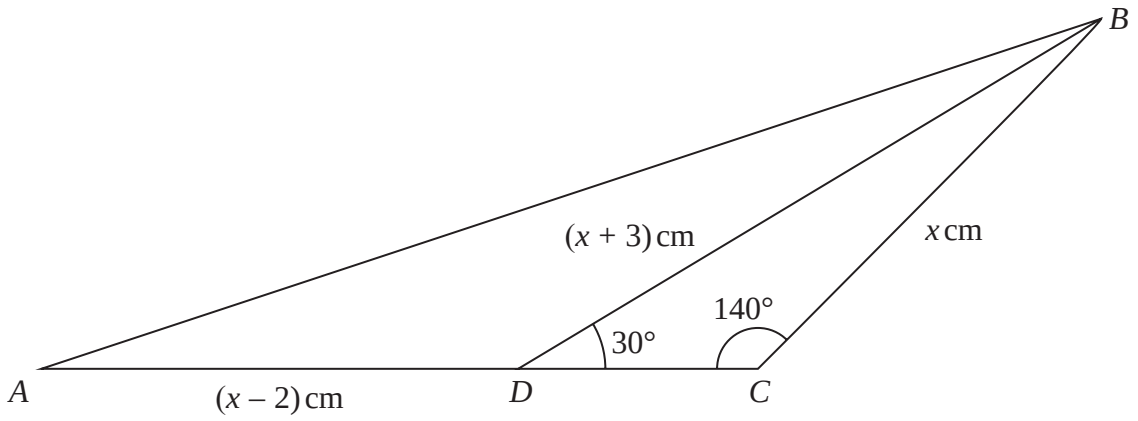

Figure 1

Figure 1 shows a sketch of triangle *ABD* and triangle *BCD*

Given that

- *ADC* is a straight line
- $BD = (x + 3)\,\text{cm}$
- $BC = x\,\text{cm}$
- angle *BDC* = 30°
- angle *BCD* = 140°

(a) show that $x = 10.5$ correct to 3 significant figures.

(3)

Given also that $AD = (x – 2)\,\text{cm}$

(b) find the length of *AB*, giving your answer to 3 significant figures.

(2)