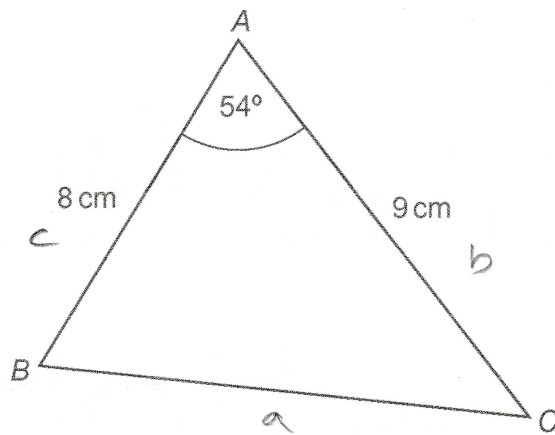


Cosine Rule Questions

1

ABC is a triangle.



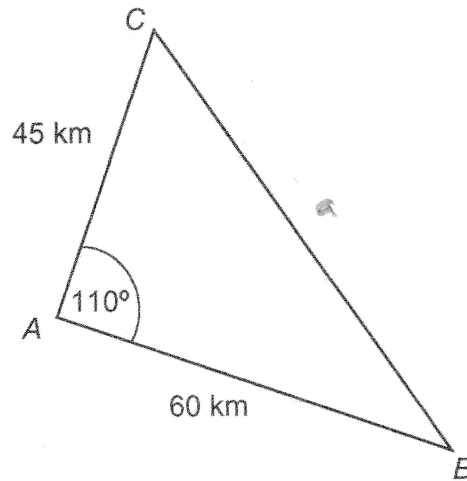
Not drawn accurately

Calculate the length BC.

$$a^2 = b^2 + c^2 - 2bc \cos A$$
$$a^2 = 9^2 + 8^2 - 2 \times 8 \times 9 \times \cos 54$$
$$a^2 = 60.3589$$

Answer 7.769 or 7.8 cm (3 marks)

2



Not drawn accurately

Work out the length BC .

[3 marks]

$$a^2 = 45^2 + 60^2 - 2 \times 45 \times 60 \times \cos 110$$

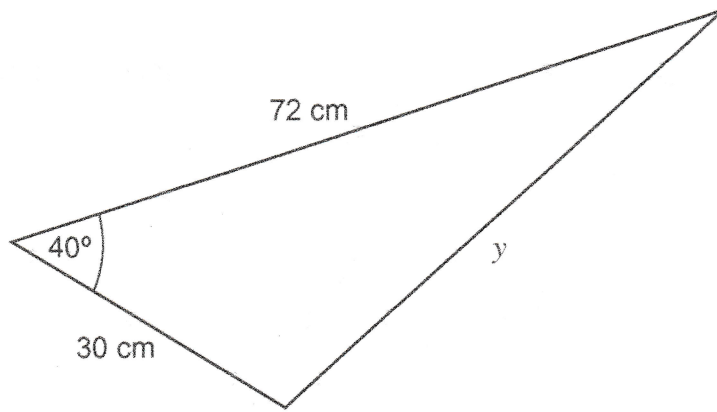
$$a^2 = 7471.9$$

$$a = 86.44$$

Answer 86.4 km

3

Work out the length y .



Not drawn accurately

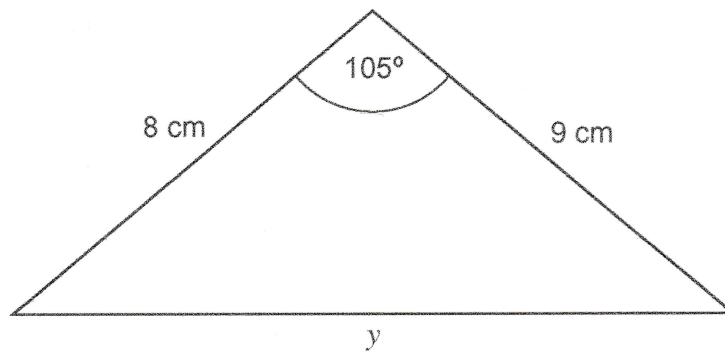
[3 marks]

$$y^2 = 30^2 + 72^2 - 2 \times 72 \times 30 \times \cos 40$$
$$y^2 = 2774.668$$

Answer 52.675 cm

4

Work out the length y .



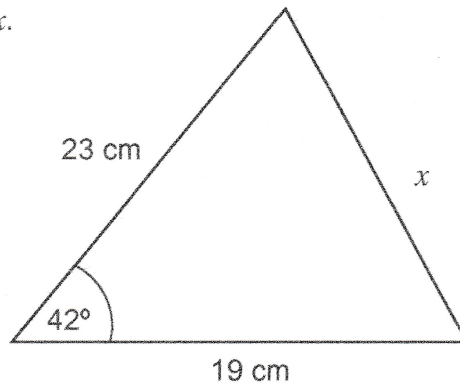
Not drawn accurately

[3 marks]

$$y^2 = 8^2 + 9^2 - 2 \times 8 \times 9 \times \cos 105$$
$$y^2 = 182.2699$$

Answer 13.5 cm

5

Work out the length x .

Not drawn accurately

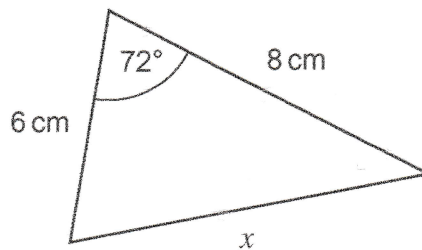
$$x^2 = 19^2 + 23^2 - 2 \times 19 \times 23 \times \cos 42$$

$$x^2 = 240.49$$

$$x = 15.5$$

Answer 15.5 cm [3 marks]

6

Work out the length x for this triangle.

Not drawn accurately

$$x^2 = 6^2 + 8^2 - 2 \times 6 \times 8 \times \cos 72$$

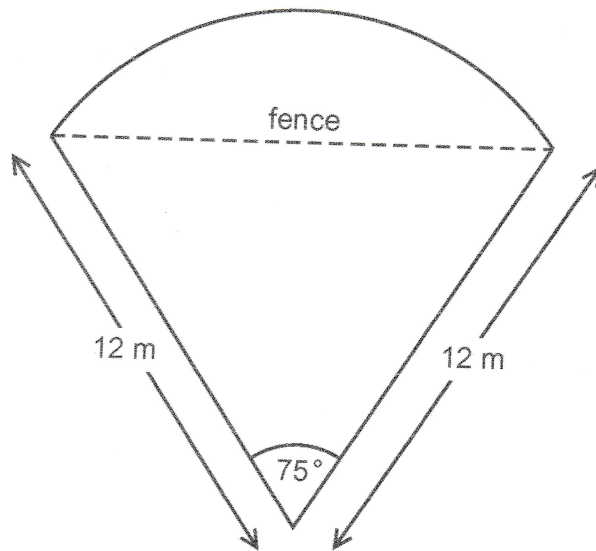
$$x^2 = 70.33$$

$$x = 8.38656$$

Answer 8.4 cm (3 marks)

7

The flower bed is divided into a triangle and a segment by a fence.



Not drawn accurately

Work out the length of the fence.

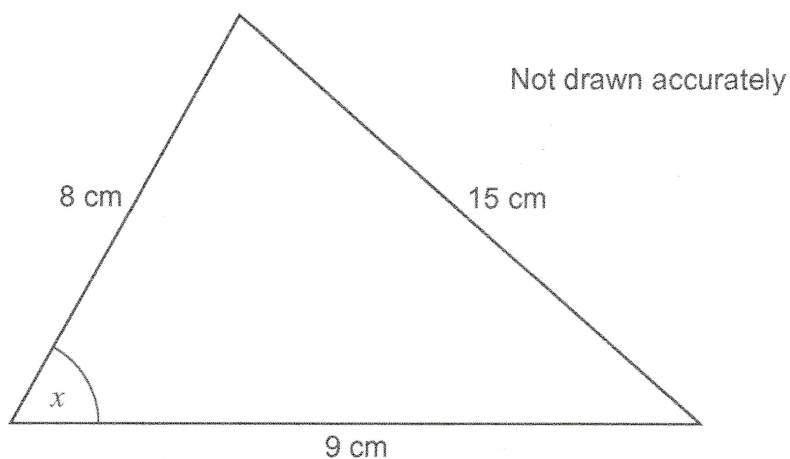
[3 marks]

$$f^2 = 12^2 + 12^2 - 2 \times 12 \times 12 \times \cos 75$$

$$f^2 = 213.46$$

Answer 14.6 m

8



- 8 (a) Which equation is correct for the triangle?
Circle your answer.

[1 mark]

$$\cos x = \frac{15^2 - 8^2 - 9^2}{2 \times 8 \times 9}$$

$$\cos x = \frac{8^2 + 9^2 - 15^2}{15 \times 8 \times 9}$$

$$\cos x = \frac{8^2 + 9^2 - 15^2}{2 \times 8 \times 9}$$

$$\cos x = \frac{15^2 - 8^2 + 9^2}{15 \times 8 \times 9}$$

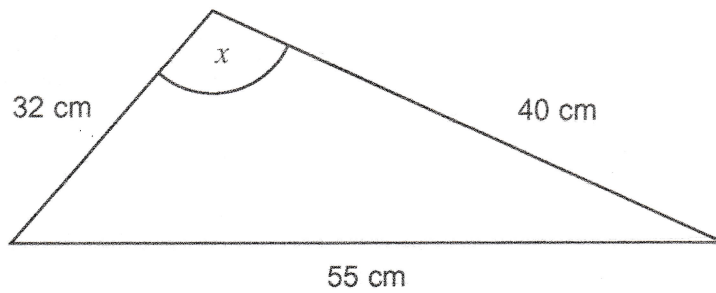
- 8 (b) Use your calculator to work out the value of x in your equation.

[1 mark]

$$\cos(x) = -\frac{5}{9}$$
$$\cos^{-1}\left(-\frac{5}{9}\right)$$

Answer 123.7 degrees

9

Work out the size of angle x .

Not drawn accurately

[3 marks]

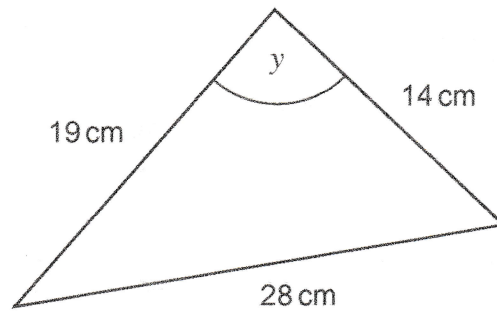
$$\cos x = \frac{40^2 + 32^2 - 55^2}{2 \times 40 \times 32}$$

$$\cos x = -0.15664$$

$$x = 99$$

Answer 99 degrees

10 (6)

Work out the size of angle y .

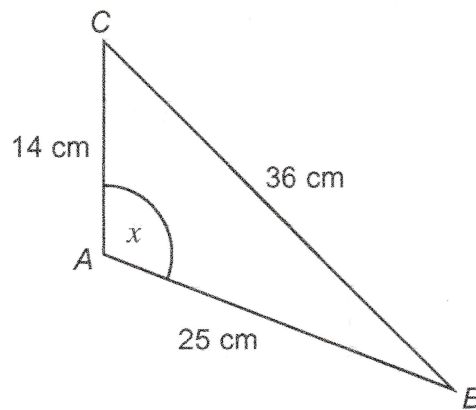
Not drawn accurately

$$\cos(y) = \frac{14^2 + 19^2 - 28^2}{2 \times 14 \times 19}$$

$$\cos(y) = -0.42669$$

Answer 115.5 degrees (3 marks)

11

Work out the size of angle x .

Not drawn accurately

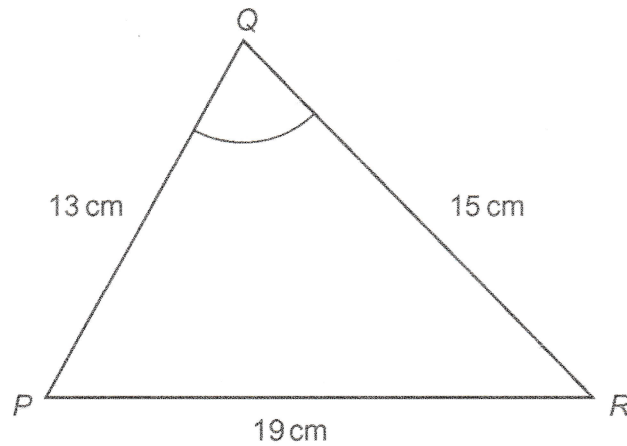
$$\cos x = \frac{25^2 + 14^2 - 36^2}{2 \times 14 \times 25}$$

$$\cos x = -0.67857$$

$$x = 132.7$$

Answer 132.7 degrees [3 marks]

12

Work out the size of angle PQR .Not drawn
accurately

$$\cos Q = \frac{15^2 + 13^2 - 19^2}{2 \times 15 \times 13}$$

$$\cos Q = 0.0846153$$

$$Q = 85.146$$

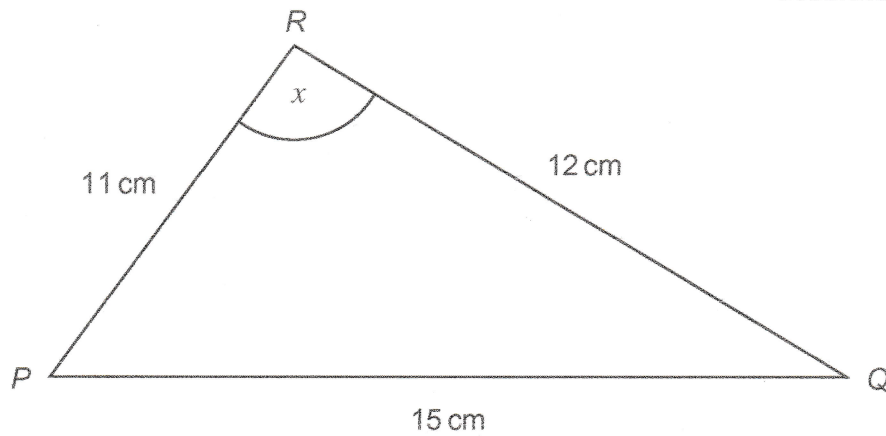
Answer

85.1

degrees

(3 marks)

13

Not drawn
accuratelyUse the cosine rule to work out the size of angle x .

[3 marks]

$$\cos(x) = \frac{12^2 + 11^2 - 15^2}{2 \times 12 \times 11}$$

$$\cos(x) = 0.151515$$

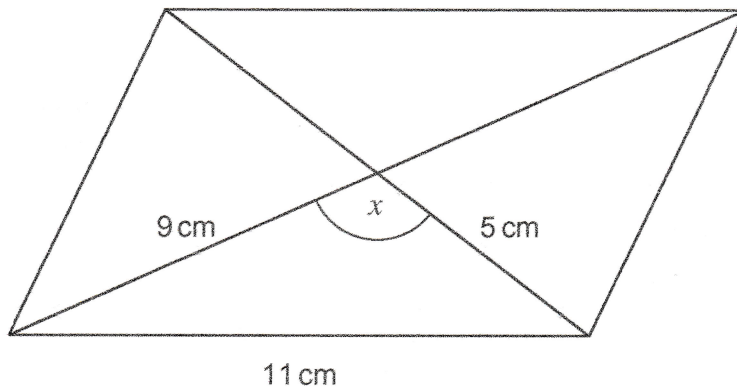
$$x = 81.285$$

Answer 81 degrees

14

The diagram shows a parallelogram.

Not drawn accurately



Work out the size of angle x .

$$\cos(x) = \frac{5^2 + 9^2 - 11^2}{2 \times 5 \times 9}$$

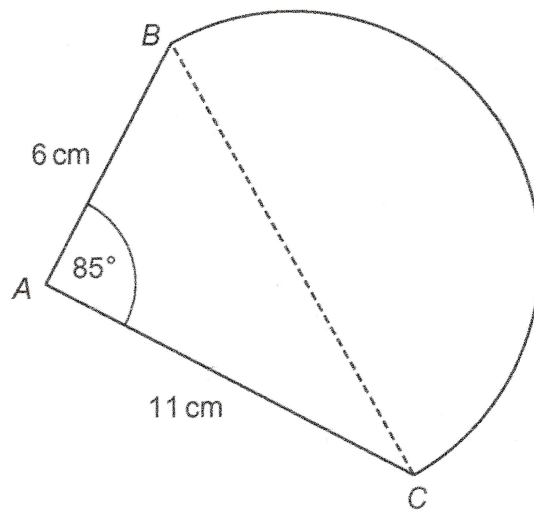
$$\cos(x) = -\frac{1}{6}$$

$$x = 99.594$$

Answer 99.6 degrees (3 marks)

15

This shape is made from a semicircle and a triangle.



Not drawn accurately

Calculate the perimeter of the shape.

[5 marks]

$$BC = a \quad a^2 = 6^2 + 11^2 - 2 \times 6 \times 11 \times \cos 85$$

$$a^2 = 145.495442$$

$$a = 12.06$$

$$\text{diameter} = 12.06 \quad \text{radius} = 6.03$$

$$\text{arc of a semi circle} = \pi r$$

$$= \pi \times 6.03$$

$$\text{arc} = 18.9438$$

$$11 + 6 + 18.9438 = 35.94$$

Answer 35.9 cm