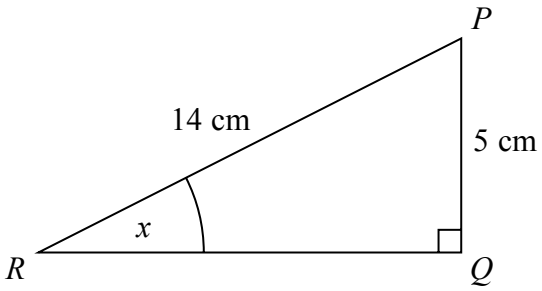
1 *PQR* is a right-angled triangle.



Work out the size of the angle marked *x*.
Give your answer correct to 1 decimal place.

..... °

(Total for Question 1 is 2 marks)

2 Here is a right-angled triangle.

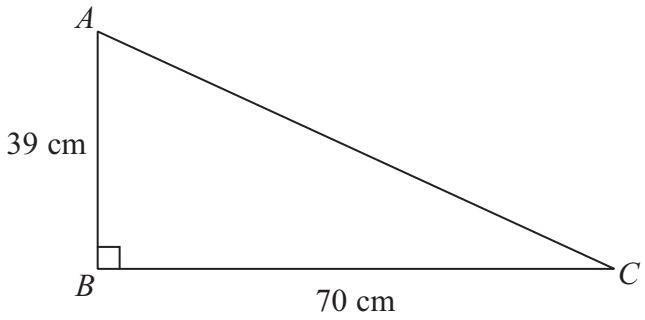


Diagram **NOT** accurately drawn

Work out the length of *AC*.
Give your answer correct to 1 decimal place.

..... cm

(Total for Question 2 is 3 marks)

3

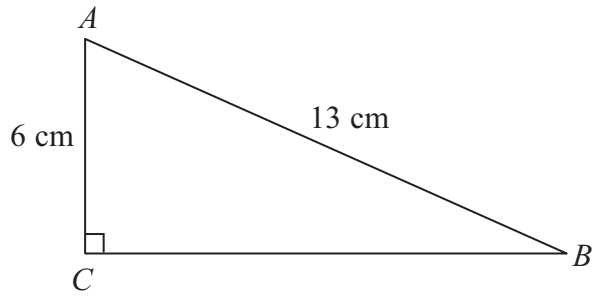


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.
AC = 6 cm
AB = 13 cm

(a) Work out the length of *BC*.
Give your answer correct to 3 significant figures.

..... cm

(3)

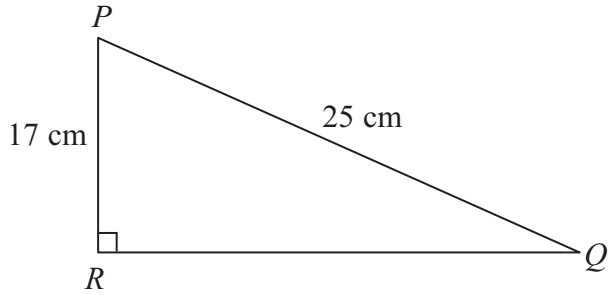


Diagram **NOT** accurately drawn

PQR is a right-angled triangle.
PR = 17 cm
PQ = 25 cm

(b) Work out the size of angle *RPQ*.
Give your answer correct to 1 decimal place.

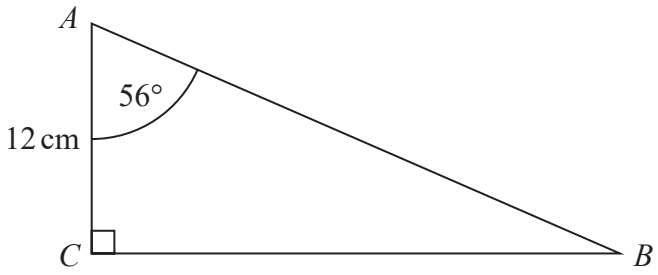
°

.....

(3)

(Total for Question 3 is 6 marks)

4 *ABC* is a right-angled triangle.

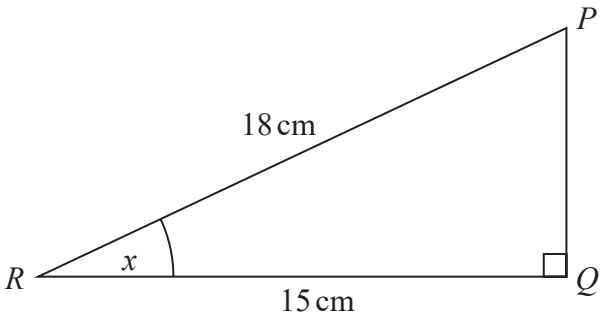


(a) Work out the length of *BC*.
Give your answer correct to 1 decimal place.

..... cm

(2)

PQR is a right-angled triangle.



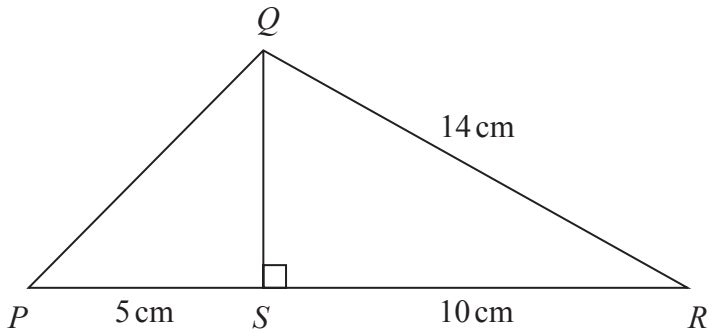
(b) Work out the size of the angle marked *x*.
Give your answer correct to 1 decimal place.

.....°

(2)

(Total for Question 4 is 4 marks)

5



In triangle PQR,

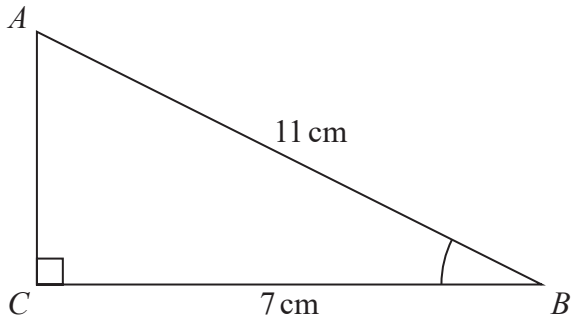
S is the point on PR such that angle $RSQ = 90°$
$RQ = 14$ cm
$RS = 10$ cm
$SP = 5$ cm

Work out the length of PQ.

cm

(Total for Question 5 is 4 marks)

6 *ABC* is a right-angled triangle.



(a) Work out the size of angle *ABC*.
Give your answer correct to 1 decimal place.

.....°

(2)

The length of the side *AB* is reduced by 1 cm.

The length of the side *BC* is still 7 cm.
Angle *ACB* is still 90°

(b) Will the value of cos *ABC* increase or decrease?
You must give a reason for your answer.

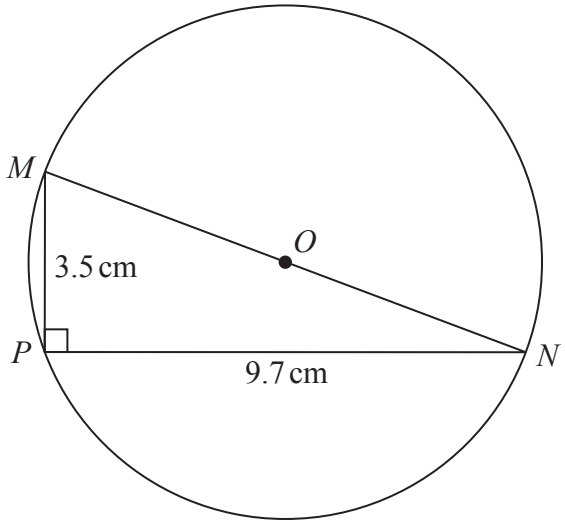
.....

.....

(1)

(Total for Question 6 is 3 marks)

7



M, *N* and *P* are points on a circle, centre *O*.
MON is a diameter of the circle.

MP = 3.5 cm
PN = 9.7 cm

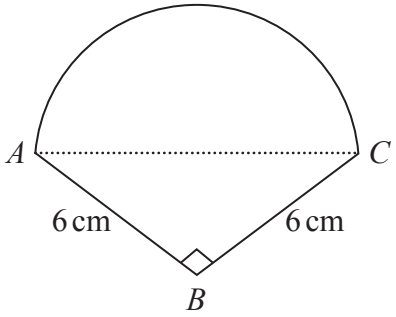
Angle *MPN* = 90°

Work out the circumference of the circle.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 7 is 4 marks)

8 The diagram shows a shape made from a right-angled triangle and a semicircle.



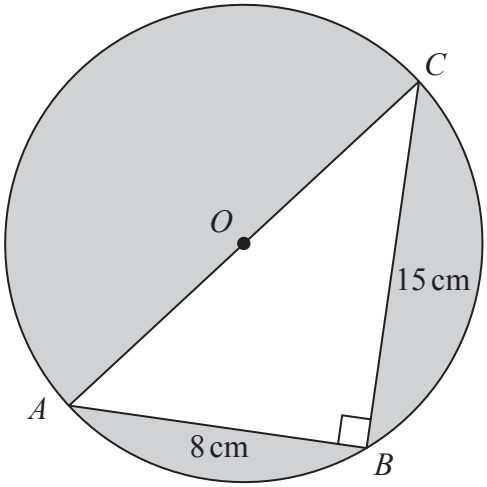
AC is the diameter of the semicircle.
$BA = BC = 6$ cm
Angle $ABC = 90°$

Work out the area of the shape.
Give your answer correct to 1 decimal place.

..... cm^2

(Total for Question 8 is 5 marks)

9 A, B and C are points on a circle with centre O.



AOC is a diameter of the circle.

$AB = 8\,\text{cm}$ $BC = 15\,\text{cm}$

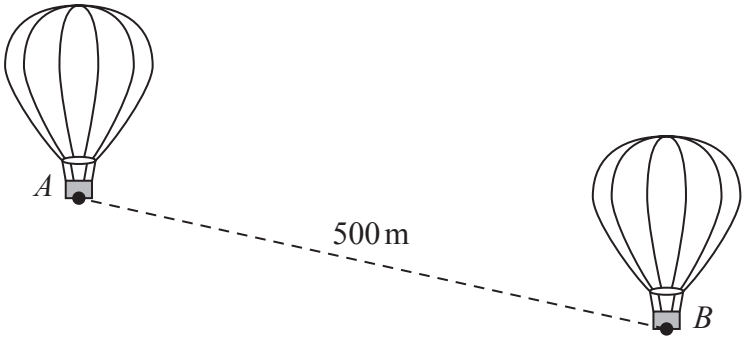
Angle $ABC = 90°$

Work out the total area of the regions shown shaded in the diagram.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 9 is 5 marks)

10 The diagram shows two hot air balloons.
A is a point on the base of one of the balloons and *B* is a point on the base of the other balloon.



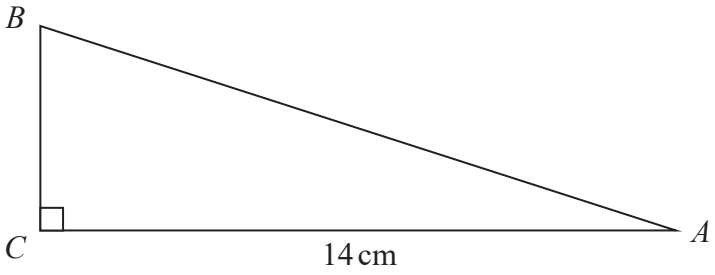
The distance between *A* and *B* is 500 metres.
The angle of depression of *B* from *A* is 23°

Calculate the vertical height of *A* above *B*.
Give your answer correct to one decimal place.

..... metres

(Total for Question 10 is 3 marks)

11 ABC is a right-angled triangle.



$AC = 14$ cm.
Angle $C = 90°$

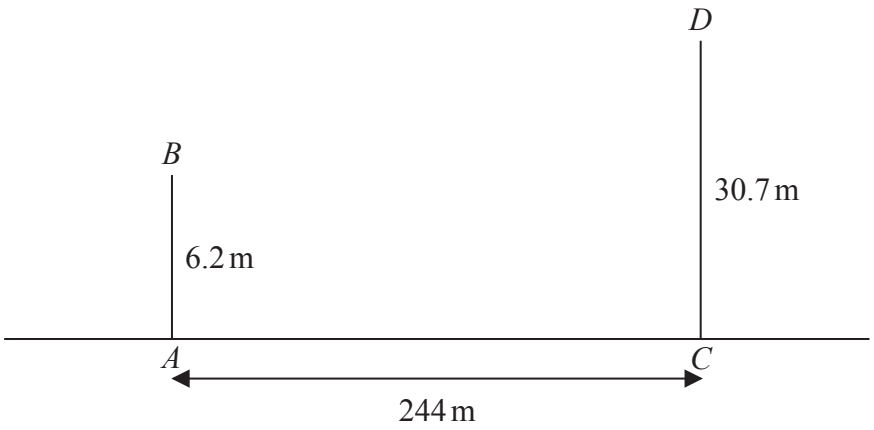
size of angle B : size of angle $A = 3 : 2$

Work out the length of AB.
Give your answer correct to 3 significant figures.

.....cm

(Total for Question 11 is 4 marks)

12 The diagram shows two vertical phone masts, AB and CD, on horizontal ground.



$AB = 6.2\,\text{m}$ $AC = 244\,\text{m}$ $CD = 30.7\,\text{m}$

Work out the size of the angle of depression of B from D
Give your answer correct to one decimal place.

.....°

(Total for Question 12 is 3 marks)

13 The diagram shows a vertical cliff with a vertical radio mast on top of the cliff and a buoy in the sea.

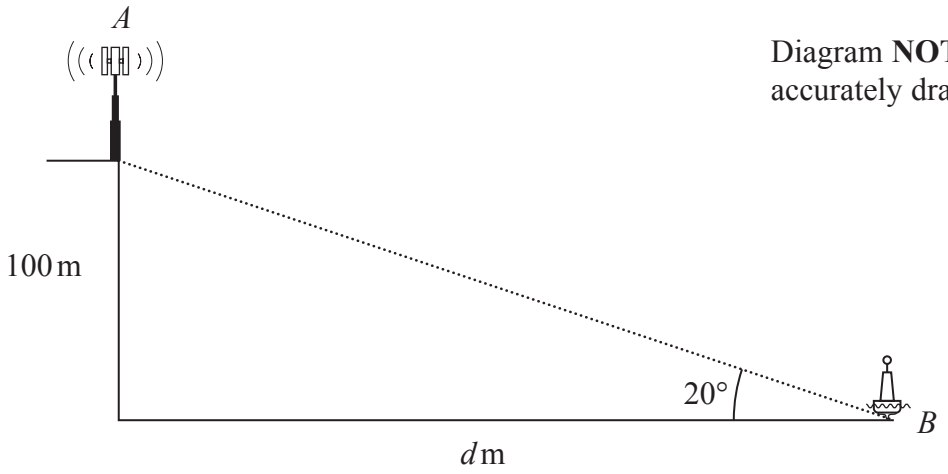


Diagram **NOT** accurately drawn

The height of the cliff is 100 metres.
The buoy is at the point B that is d metres from the base of the cliff.
The angle of elevation from B to the top of the cliff is 20°

(a) Calculate the value of d.
Give your answer correct to 3 significant figures.

$d =$ .....

(3)

The point A at the top of the radio mast is vertically above the top of the cliff.
The angle of elevation from B to A is 25°

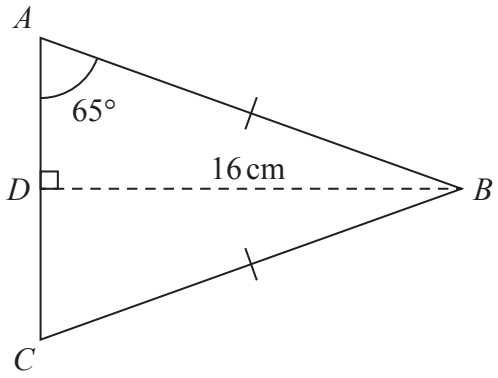
(b) Calculate the height of the radio mast.
Give your answer correct to 3 significant figures.

..... m

(3)

(Total for Question 13 is 6 marks)

14 Here is isosceles triangle *ABC*.



D is the midpoint of *AC* and *DB* = 16 cm.

Angle *DAB* = 65°

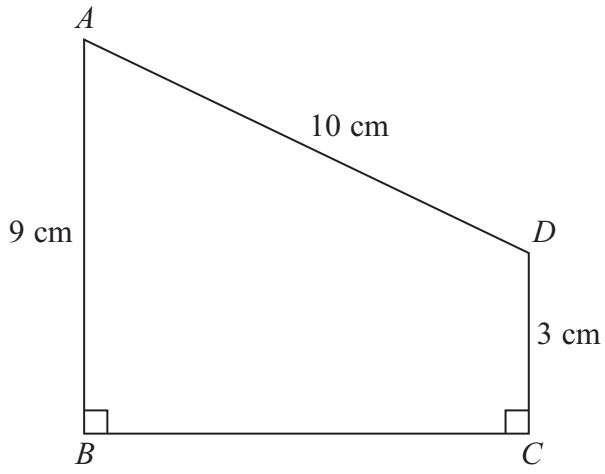
Work out the perimeter of triangle *ABC*.
Give your answer correct to one decimal place.

..... cm

(Total for Question 14 is 4 marks)

15 *ABCD* is a trapezium.

Diagram **NOT** accurately drawn



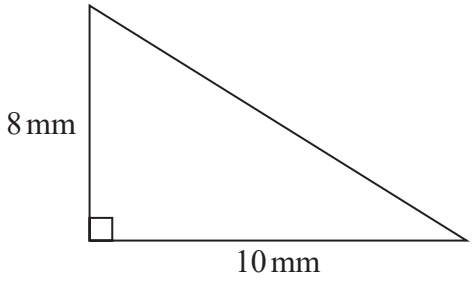
AD = 10 cm
AB = 9 cm
DC = 3 cm
Angle *ABC* = angle *BCD* = 90°

Calculate the length of *AC*.
Give your answer correct to 3 significant figures.

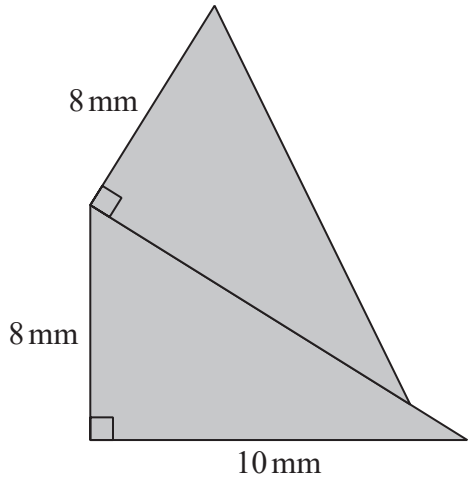
..... cm

(Total for Question 15 is 5 marks)

16 Here is a right-angled triangle.



The shaded shape below is made from two of these triangles.

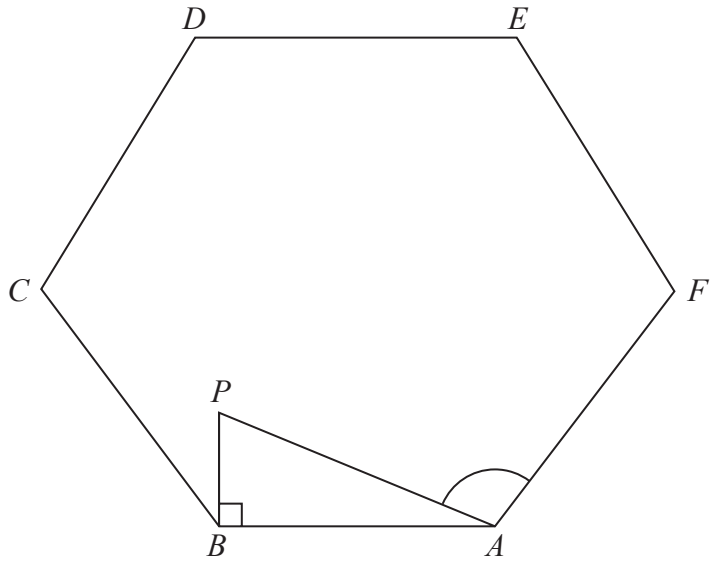


Work out the perimeter of the shaded shape.
Give your answer correct to 3 significant figures.

..... mm

(Total for Question 16 is 4 marks)

17 The diagram shows triangle *ABP* inside the regular hexagon *ABCDEF*



AB = 5 cm *BP* = 2 cm Angle *ABP* = 90°

Work out the size of angle *PAF*
Give your answer correct to 3 significant figures.

.....°

(Total for Question 17 is 5 marks)

18 Here is triangle *ABD*.

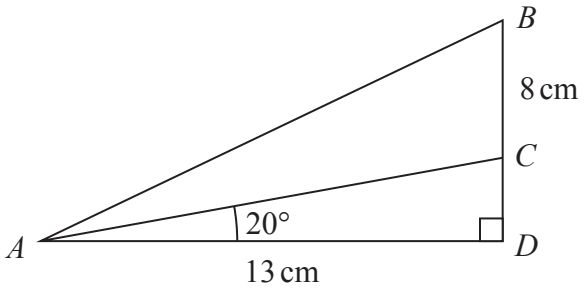


Diagram **NOT** accurately drawn

The point *C* lies on *BD*.

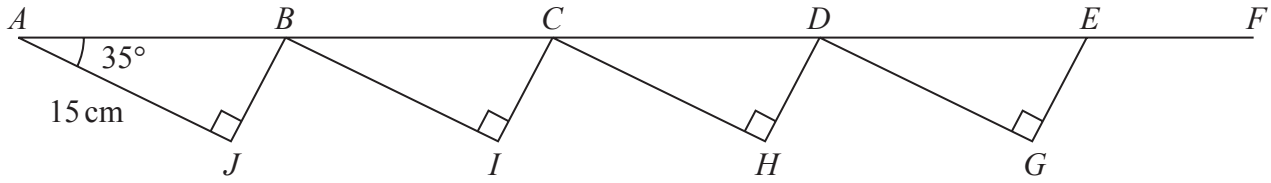
AD = 13 cm *BC* = 8 cm angle *ADB* = 90° angle *CAD* = 20°

Calculate the size of angle *BAC*.
Give your answer correct to 1 decimal place.

°

(Total for Question 18 is 5 marks)

19 The diagram shows four congruent right-angled triangles *ABJ*, *BCI*, *CDH* and *DEG*.
The diagram also shows the straight line *ABCDEF*.



AJ = 15 cm
Angle *BAJ* = 35°

AF = 80 cm

Work out the length of *EF*.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 19 is 5 marks)

20 The diagram shows a quadrilateral *ABCD*.

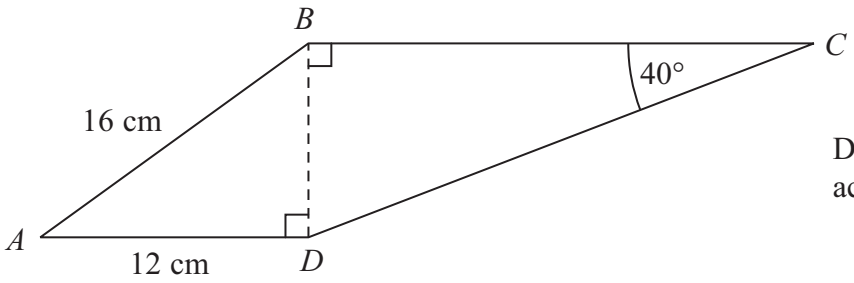


Diagram **NOT** accurately drawn

AB = 16 cm.
AD = 12 cm.
Angle *BCD* = 40°.
Angle *ADB* = angle *CBD* = 90°.

Calculate the length of *CD*.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 20 is 5 marks)

21 *ABC* is an isosceles triangle.

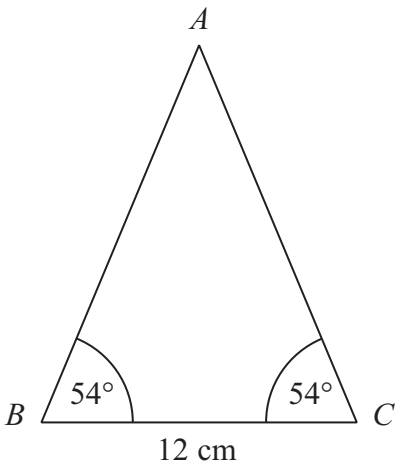


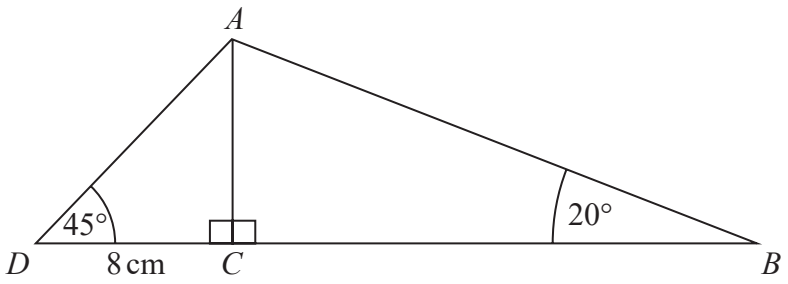
Diagram **NOT** accurately drawn

Work out the area of the triangle.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 21 is 4 marks)

22 *ABC* and *ACD* are right-angled triangles.



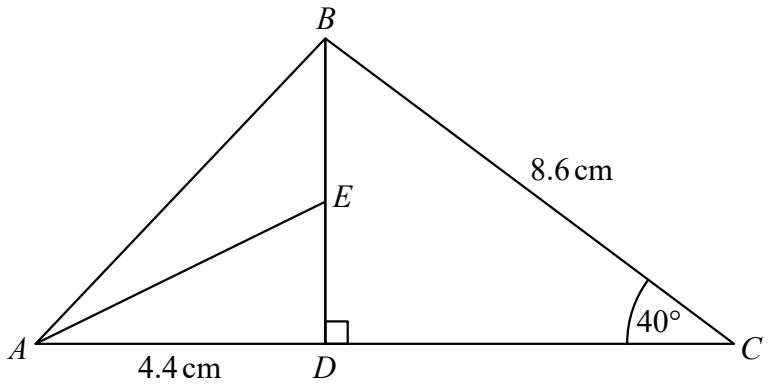
DC = 8 cm
Angle *ADC* = 45°
Angle *ABC* = 20°

Work out the length of *AB*.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 22 is 3 marks)

23 The diagram shows triangle *ABC*.



ADC and *DEB* are straight lines.

AD = 4.4 cm
BC = 8.6 cm
E is the midpoint of *DB*.

Angle *CDB* = 90°
Angle *DCB* = 40°

Work out the size of angle *EAD*.
Give your answer correct to 1 decimal place.
You must show all your working.

.....°

(Total for Question 23 is 4 marks)

24 Here is a parallelogram.

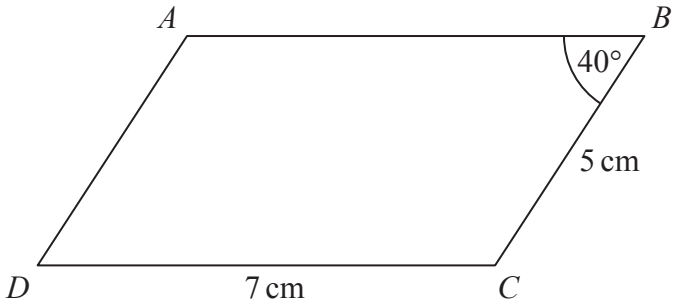


Diagram **NOT** accurately drawn

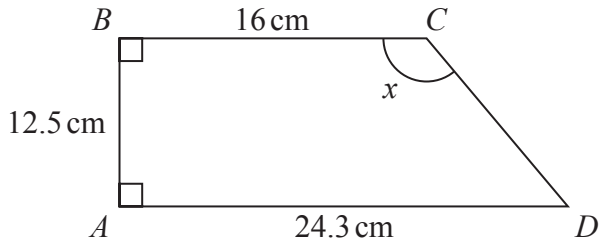
$DC = 7$ cm
$CB = 5$ cm
Angle ABC is 40°

Work out the area of the parallelogram.
Give your answer correct to 1 decimal place.

..... cm^2

(Total for Question 24 is 3 marks)

25 *ABCD* is a trapezium.

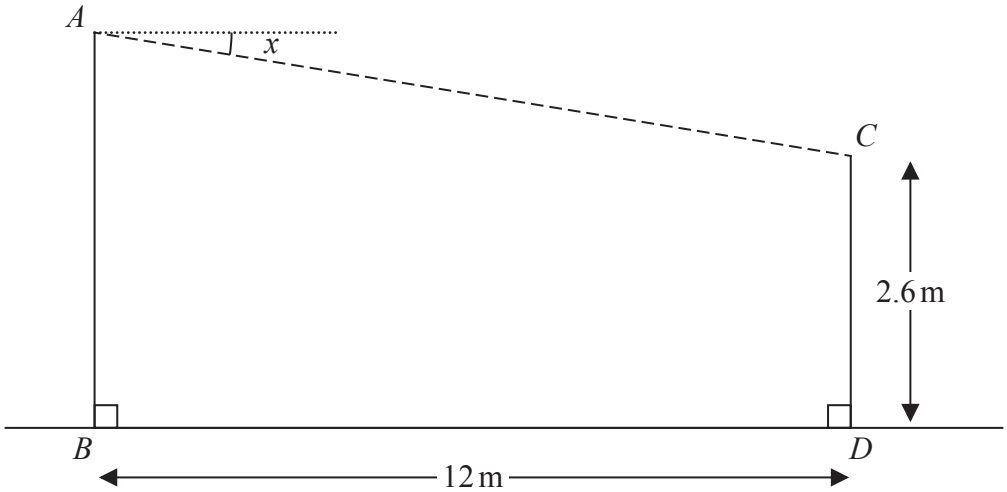


Work out the size of angle *x*.
Give your answer correct to 1 decimal place.

.....°

(Total for Question 25 is 4 marks)

26 A zip wire is shown as the dashed line AC in the diagram.



The zip wire is supported by two vertical posts AB and CD standing on horizontal ground.

$CD = 2.6\,\text{m}$ $BD = 12\,\text{m}$

The zip wire makes an angle x with the horizontal, as shown in the diagram.
The design of the zip wire requires the angle x to be at least 5°

Work out the least possible height of the post AB
Give your answer correct to 3 significant figures.

..... m

(Total for Question 26 is 3 marks)

27 In the diagram, *ABC* is a right-angled triangle and *DEF* is a semicircular arc.

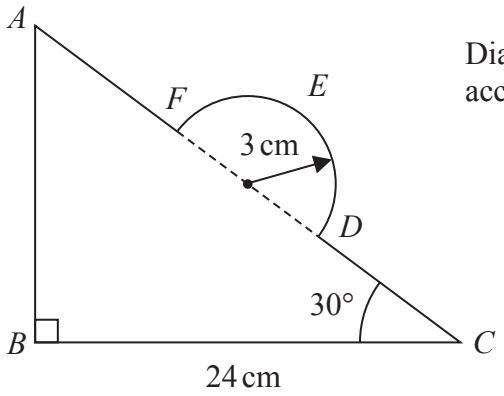


Diagram **NOT** accurately drawn

In triangle *ABC*

$BC = 24\,\text{cm}$ angle $ABC = 90°$ angle $BCA = 30°$

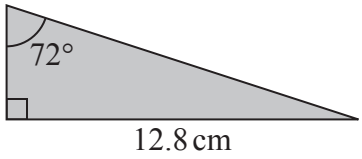
The points *D* and *F* lie on *AC* so that *DF* is the diameter of the semicircular arc *DEF*
The radius of the semicircular arc is 3 cm.

Work out the length of *AFEDC*
Give your answer correct to 2 significant figures.

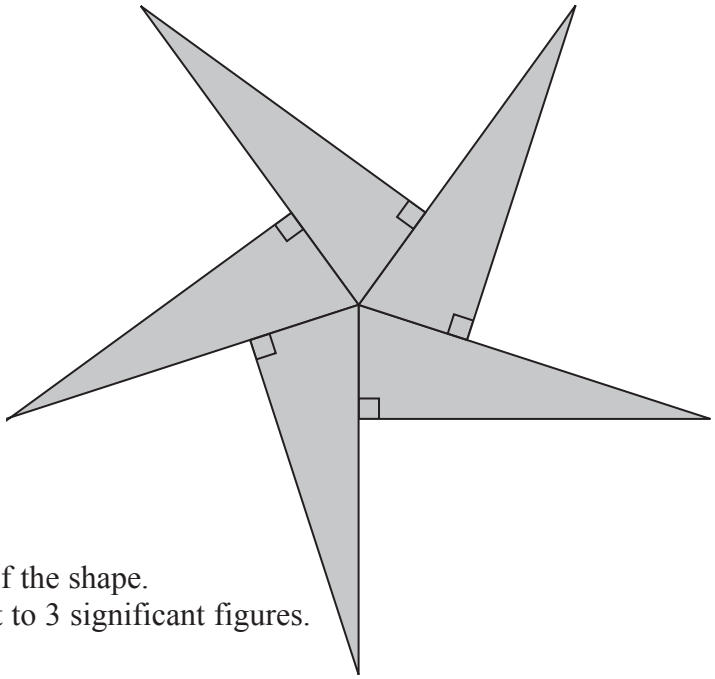
..... cm

(Total for Question 27 is 5 marks)

28 The diagram shows a right-angled triangle.



Five of these triangles are put together to make a shape.



Calculate the perimeter of the shape.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 28 is 5 marks)

29

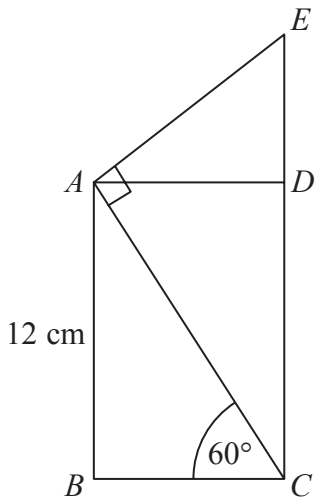


Diagram **NOT** accurately drawn

ABCD is a rectangle.
CDE is a straight line.

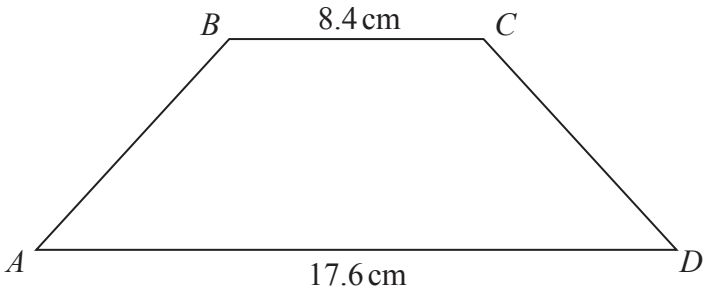
AB = 12 cm
Angle *ACB* = 60°
Angle *EAC* = 90°

Calculate the length of *CE*.
You must show all your working.

..... cm

(Total for Question 29 is 4 marks)

30 The diagram shows trapezium $ABCD$ in which BC and AD are parallel.



The trapezium has exactly one line of symmetry.

$BC = 8.4\,\text{cm}$
$AD = 17.6\,\text{cm}$

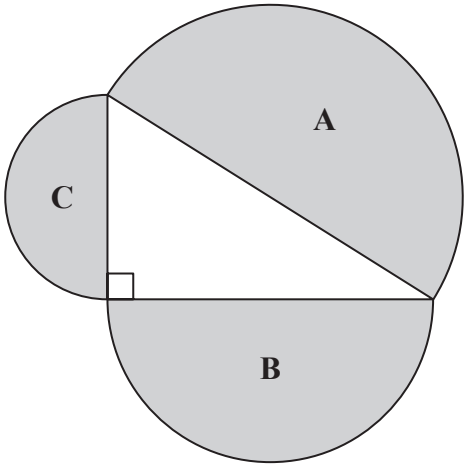
The trapezium has area $179.4\,\text{cm}^2$

Work out the size of angle ABC.
Give your answer correct to 1 decimal place.

.....°

(Total for Question 30 is 6 marks)

31 A right-angled triangle is formed by the diameters of three semicircular regions, **A**, **B** and **C** as shown in the diagram.



Show that

area of region **A** = area of region **B** + area of region **C**

(Total for Question 31 is 3 marks)