1

In triangle *PQR*,

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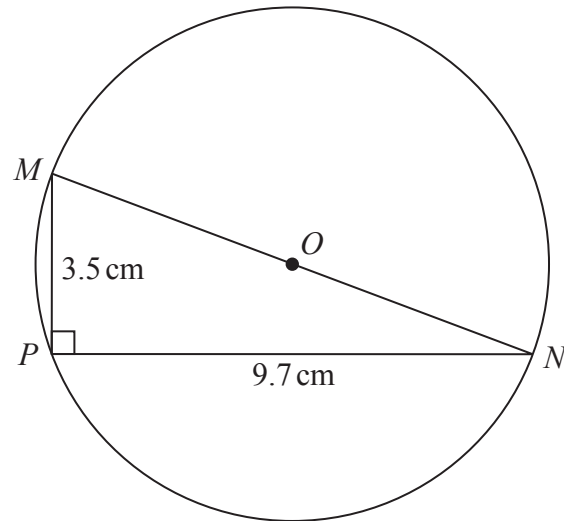*RQ* = 14 cm
RS = 10 cm
SP = 5 cm

Work out the length of *PQ*.

cm

(Total for Question 1 is 4 marks)

2

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 2 is 4 marks)
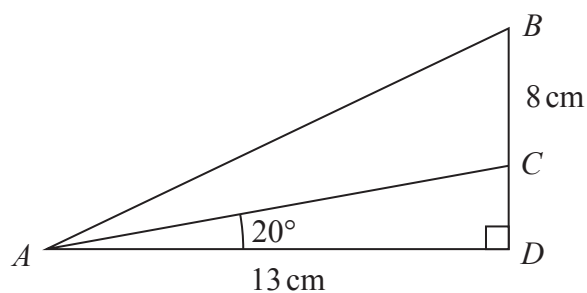
3 Here is triangle *ABD*.

Diagram **NOT** accurately drawn
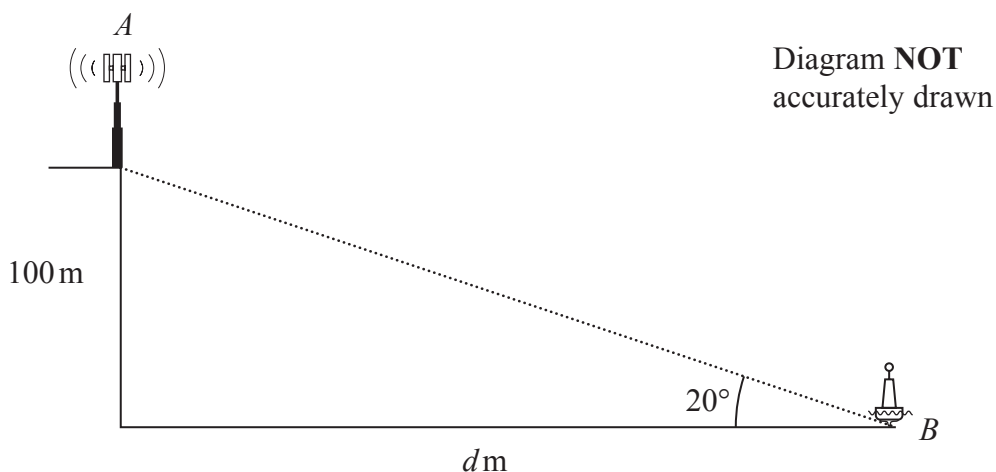
The point *C* lies on *BD*.

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 3 is 5 marks)

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

A

Diagram **NOT** accurately drawn

100 m

20°

B

d m

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°

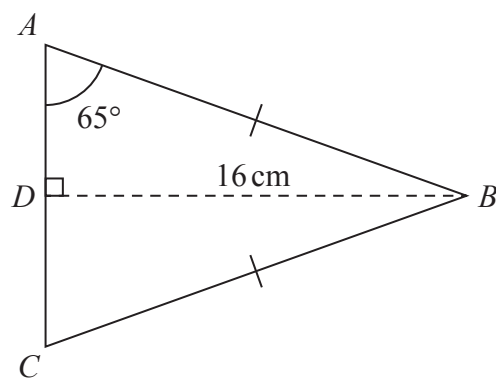(b) Calculate the height of the radio mast.
   Give your answer correct to 3 significant figures.

.... m
(3)

(Total for Question 4 is 6 marks)

5 Here is isosceles triangle *ABC*.

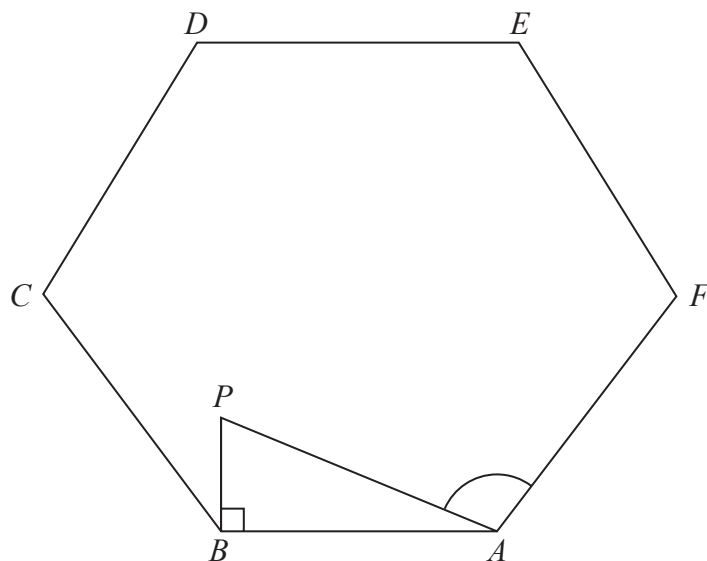*D* is the midpoint of *AC* and *DB* = 16 cm.

Angle *DAB* = 65°

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

.... cm

(Total for Question 5 is 4 marks)

6 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 6 is 5 marks)

7 The diagram shows a shape made from a right-angled triangle and a semicircle.
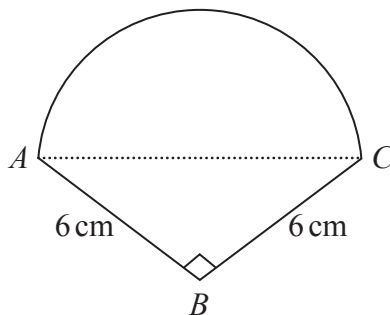
AC is the diameter of the semicircle.
BA = *BC* = 6 cm
Angle *ABC* = 90°

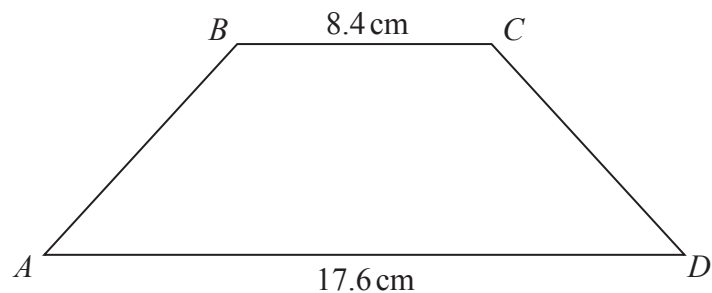Work out the area of the shape.
Give your answer correct to 1 decimal place.

.... cm²

(Total for Question 7 is 5 marks)

8 The diagram shows trapezium *ABCD* in which *BC* and *AD* are parallel.

B — 8.4 cm — C

17.6 cm

A ... D

The trapezium has exactly one line of symmetry.

BC = 8.4 cm
AD = 17.6 cm

The trapezium has area 179.4 cm²

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

.... °

(Total for Question 8 is 6 marks)

9 *ABCD* is a trapezium.

B ————— 16 cm ————— C

12.5 cm

A ————— 24.3 cm ————— D

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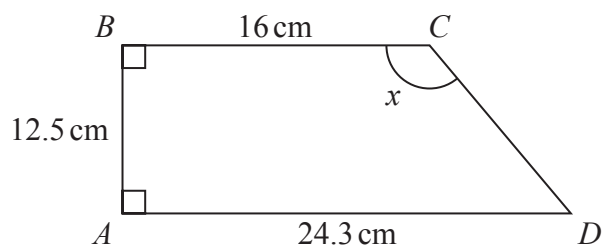
Work out the size of angle *x*.
Give your answer correct to 1 decimal place.

.... °

(Total for Question 9 is 4 marks)

10 The diagram shows four congruent right-angled triangles *ABJ*, *BCI*, *CDH* and *DEG*.
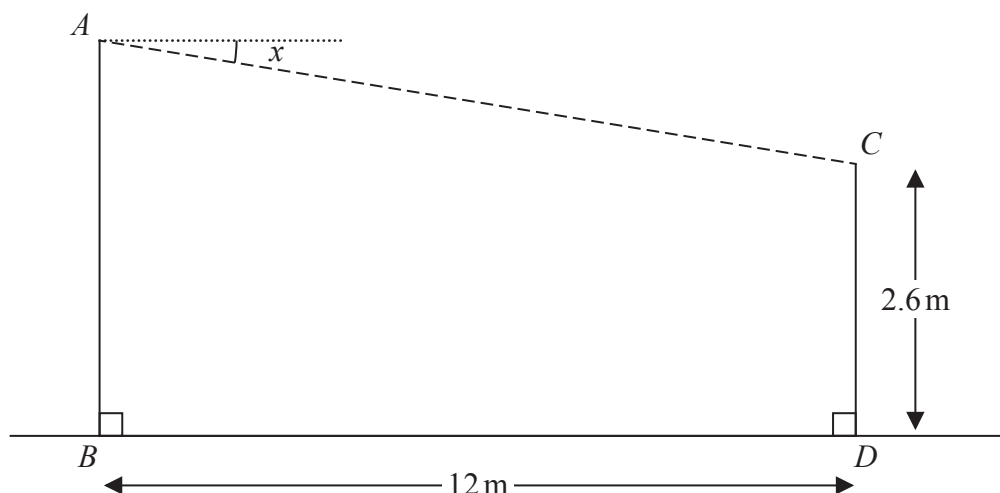The diagram also shows the straight line *ABCDEF*.
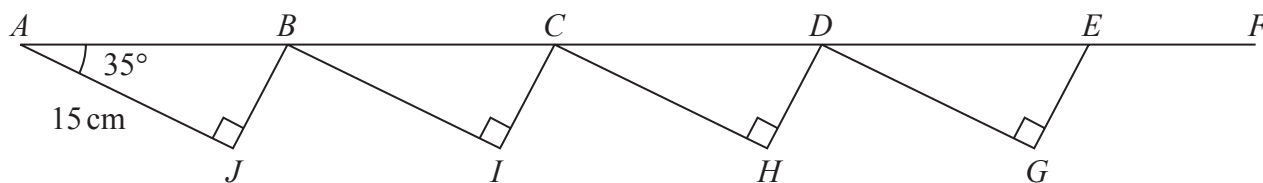
AJ = 15 cm
Angle *BAJ* = 35°

AF = 80 cm

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

.... cm

(Total for Question 10 is 5 marks)

11 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.

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

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 11 is 3 marks)

12 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.
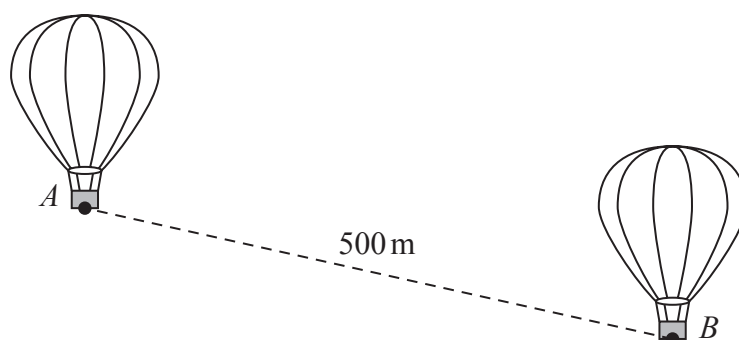
The distance between A and B is 500 metres.
The angle of depression of B from A is 23°

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

.... metres

(Total for Question 12 is 3 marks)

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

Diagram **NOT**
accurately drawn
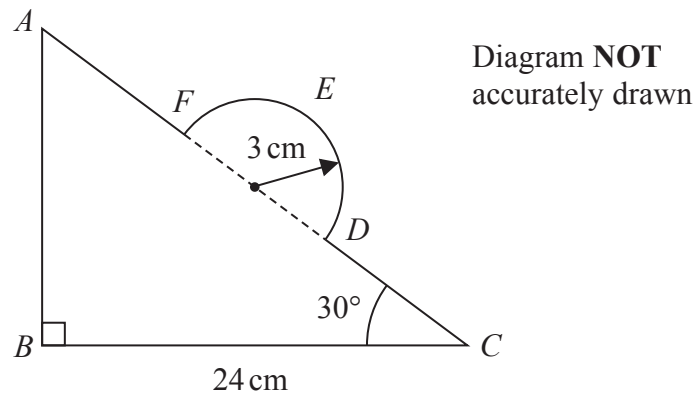
In triangle *ABC*

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

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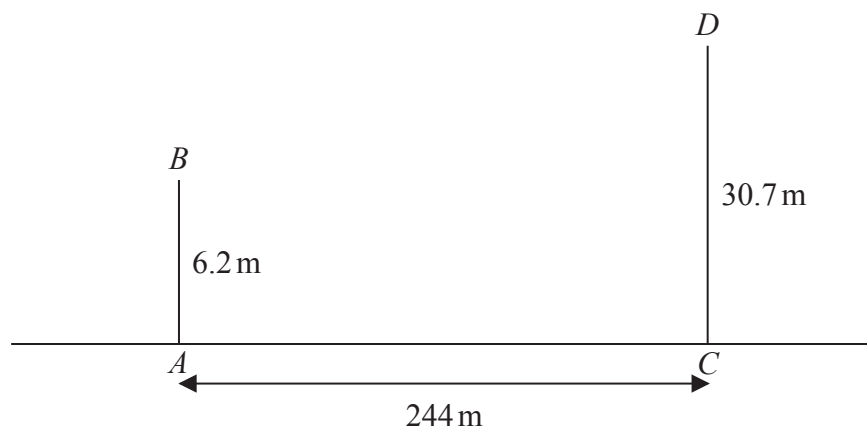The radius of the semicircular arc is 3 cm.

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

.... cm

(Total for Question 13 is 5 marks)

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

D

B

30.7 m

6.2 m

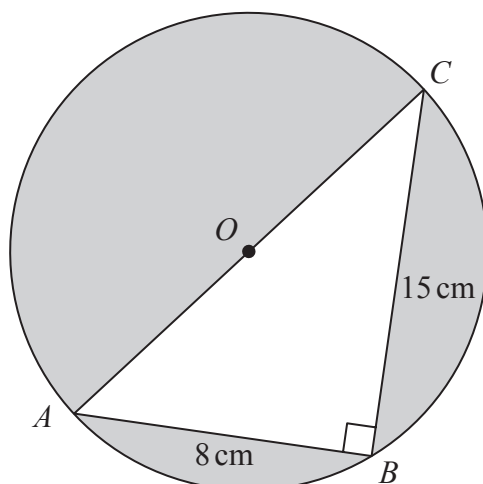*A*   *C*

244 m

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

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

.... °

(Total for Question 14 is 3 marks)

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

AOC is a diameter of the circle.

AB = 8 cm   *BC* = 15 cm
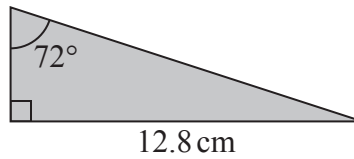
Angle *ABC* = 90°

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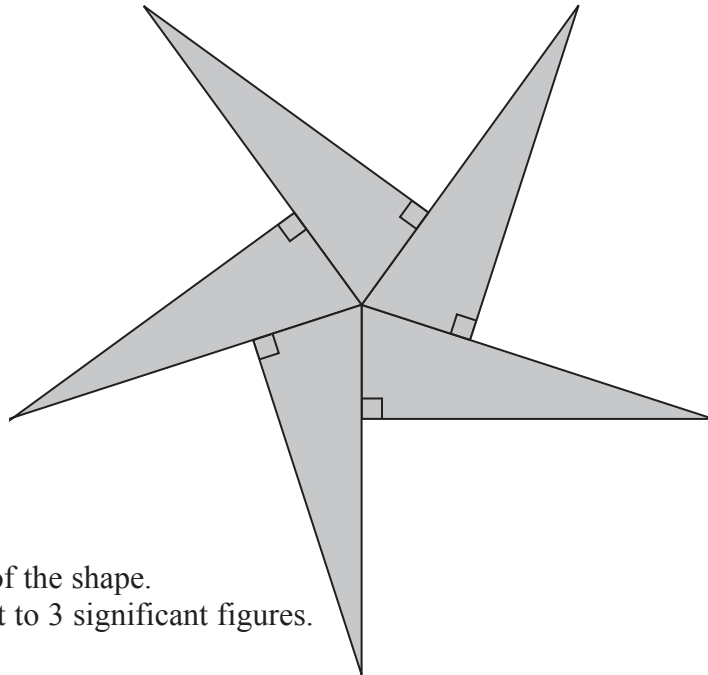Give your answer correct to 3 significant figures.

.... cm²

(Total for Question 15 is 5 marks)

16 The diagram shows a right-angled triangle.

72°

12.8 cm

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 16 is 5 marks)