SINE AND COSINE RULE

[ESTIMATED TIME: 75 minutes]

GCSE

(+ IGCSE) EXAM QUESTION PRACTICE

1. **[3 marks]**

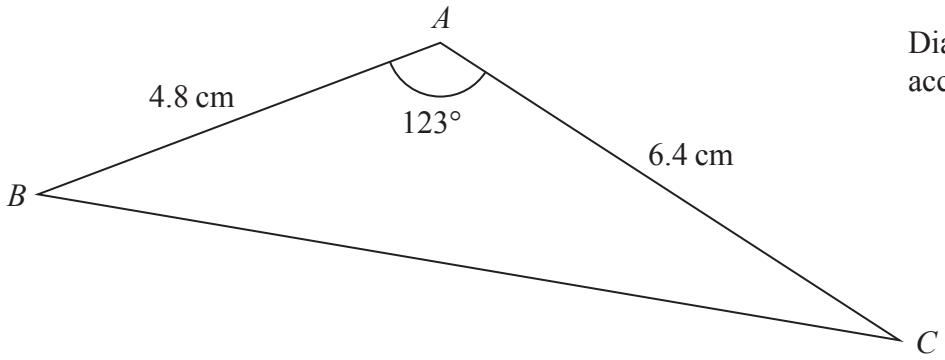


Diagram **NOT** accurately drawn

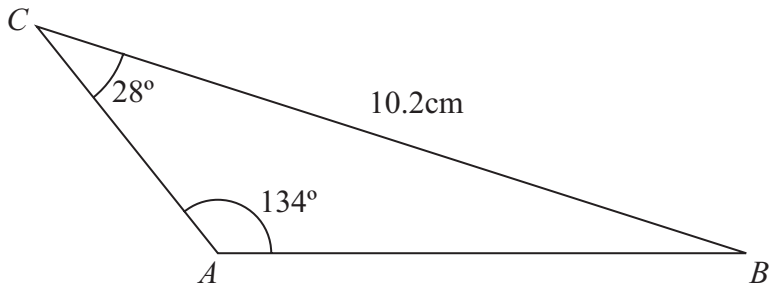
Calculate the length of *BC*.
Give your answer correct to 3 significant figures.

.....cm

2. **[3 marks]**

The diagram shows triangle *ABC*.

Diagram **NOT** accurately drawn



Angle *BCA* = 28°
Angle *CAB* = 134°
BC =10.2 cm.

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

..... cm

3. **[4 marks]**

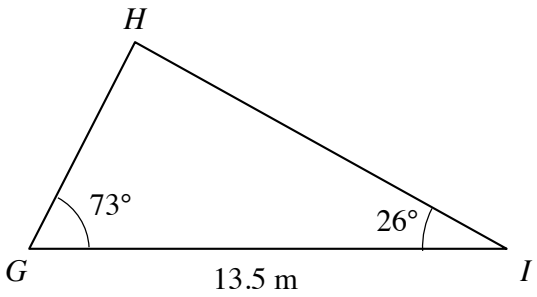


Diagram **NOT** accurately drawn

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

.....

(4)

4. **[3 marks]**

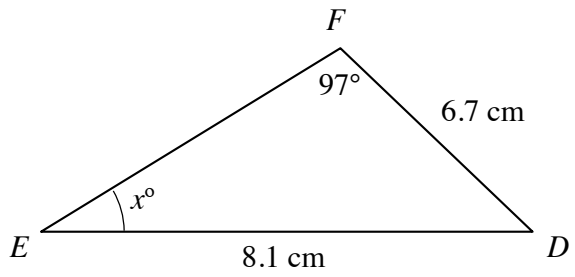


Diagram **NOT** accurately drawn

Calculate the value of *x*.
Give your answer correct to 1 decimal place.

.....

(3)

5. **[3 marks]**

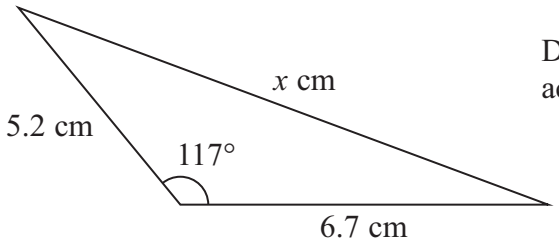


Diagram **NOT** accurately drawn

Calculate the value of x.
Give your answer correct to 3 significant figures.

x = ...

6. **[3 marks]**

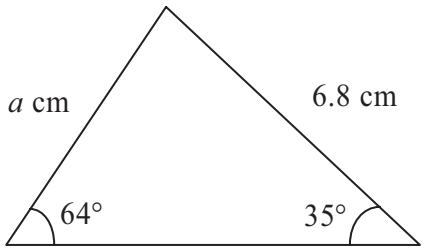


Diagram **NOT** accurately drawn

Calculate the value of a.
Give your value correct to 3 significant figures.

a = ...

7. **[3 marks]**

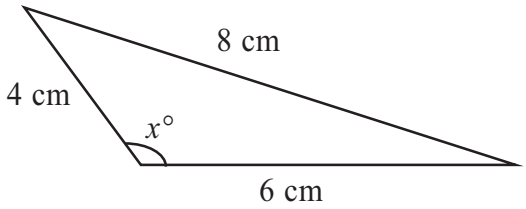


Diagram **NOT** accurately drawn

Calculate the value of x.
Give your answer correct to 1 decimal place.

$x =$ .....

8. **[4 marks]**

A triangle has sides of length 4 cm, 6 cm and 8 cm.
Calculate the size of the largest angle in this triangle.

Give your answer correct to 1 decimal place.

.....

(4)

9. **[4 marks]**

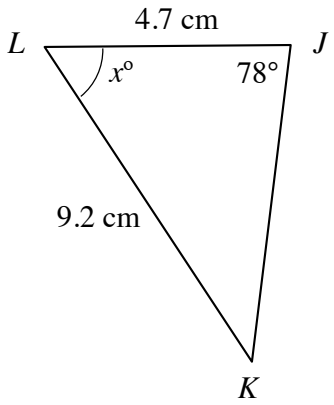


Diagram **NOT** accurately drawn

Calculate the value of x.
Give your answer correct to 1 decimal place.

.....

(4)

10. **[5 marks]**

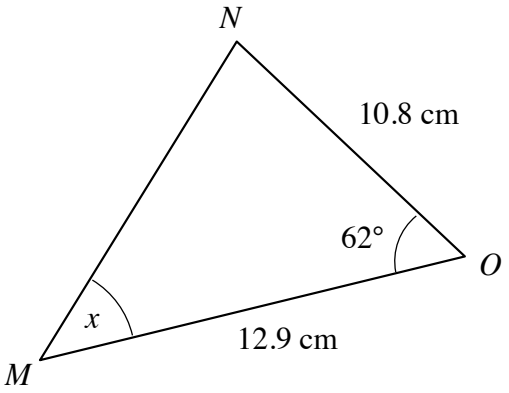


Diagram **NOT** accurately drawn

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

.....

(5)

11. **[4 marks]**

A circular clock face, centre O, has a minute hand OA and an hour hand OB.
$OA = 10$ cm.
$OB = 7$ cm.

Calculate the length of AB when the hands show 5 o'clock.
Give your answer correct to 3 significant figures.

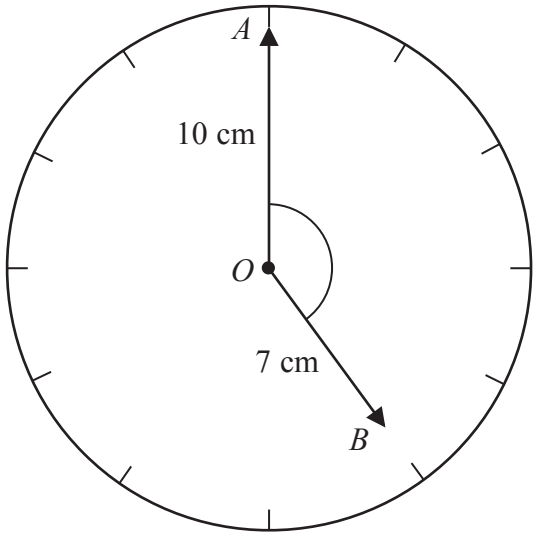


Diagram **NOT** accurately drawn

..... cm

12. **[3 marks]**

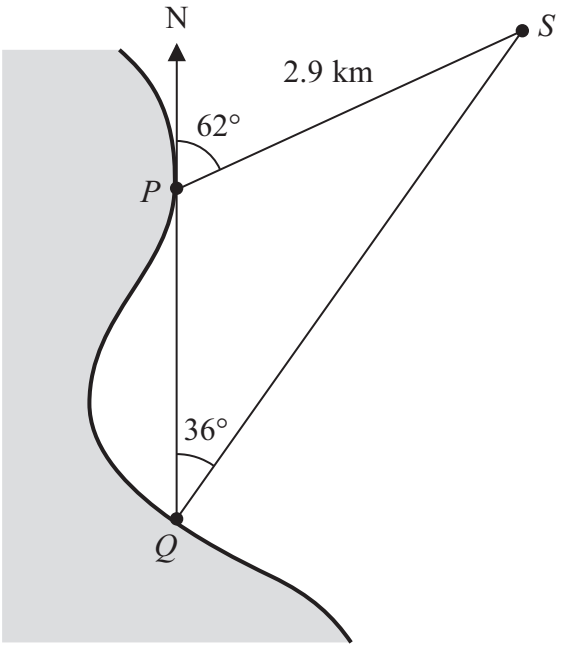


Diagram **NOT** accurately drawn

P and *Q* are two points on a coast.
P is due North of *Q*.
A ship is at the point *S*.
PS = 2.9 km.
The bearing of the ship from *P* is 062°
The bearing of the ship from *Q* is 036°

Calculate the distance *QS*.
Give your answer correct to 3 significant figures.

..... km

13. **[6 marks]**

The sides of triangle PQR are tangents to a circle.
The tangents touch the circle at the points S, T and U.
$QS = 6$ cm. $PS = 7$ cm.

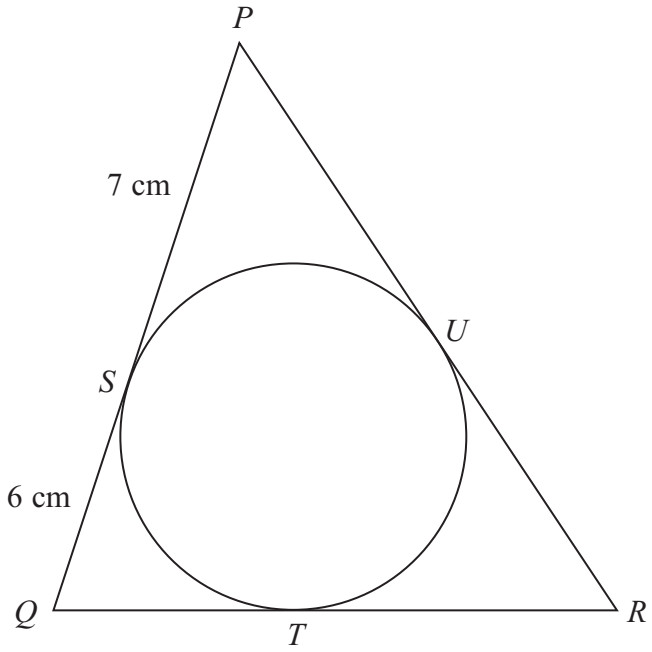


Diagram **NOT** accurately drawn

(a) (i) Write down the length of QT.

..... cm

(ii) Give a reason for your answer.

.....

(2)

The perimeter of triangle PQR is 42 cm.

(b) Calculate the size of angle PQR.
Give your answer correct to 1 decimal place.

°

.....

(4)

14. **[3 marks]**

The diagram shows the positions of two ships, A and B, and a lighthouse L.

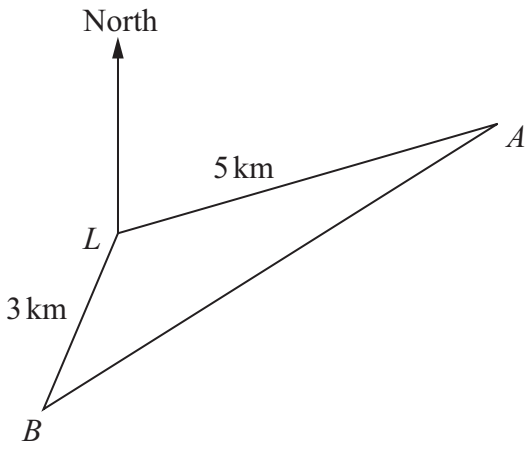


Diagram **NOT** accurately drawn

Ship A is 5 km from L on a bearing of 070° from L.
Ship B is 3 km from L on a bearing of 210° from L.
Calculate the distance between ship A and ship B.
Give your answer correct to 3 significant figures.

..... km

15. **[5 marks]**

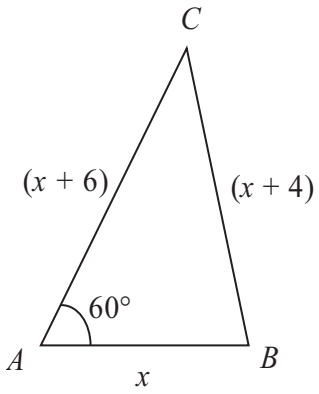


Diagram **NOT** accurately drawn

The diagram shows the length, in centimetres, of each side of triangle *ABC*.
Angle *BAC* = 60°.

Find the value of *x*.

x = ...

16. **[6 marks]**

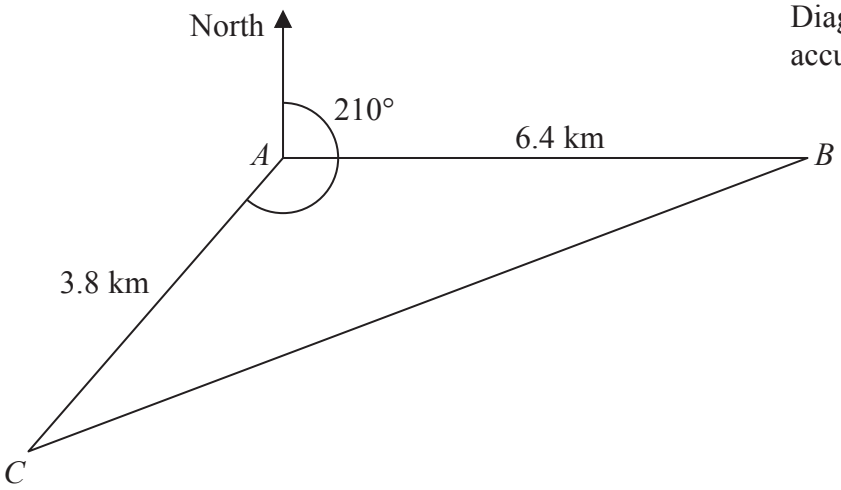


Diagram **NOT** accurately drawn

A, *B* and *C* are 3 villages.
B is 6.4 km due east of *A*.
C is 3.8 km from *A* on a bearing of 210°

Calculate the bearing of *B* from *C*.
Give your answer correct to the nearest degree.
Show your working clearly.

.....°

17. **[3 marks]**

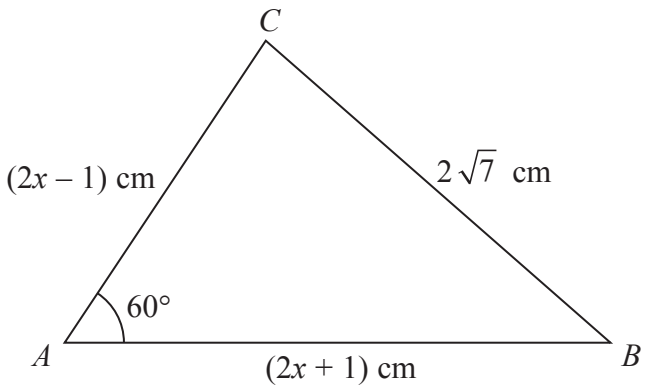


Diagram **NOT** accurately drawn

The diagram shows a triangle ABC.
$AB = (2x + 1)$ cm, $AC = (2x – 1)$ cm and $BC = 2\sqrt{7}$ cm.
Angle $BAC = 60°$

Work out the value of x.
Show clear algebraic working.

$x =$ .....

18. **[5 marks]**

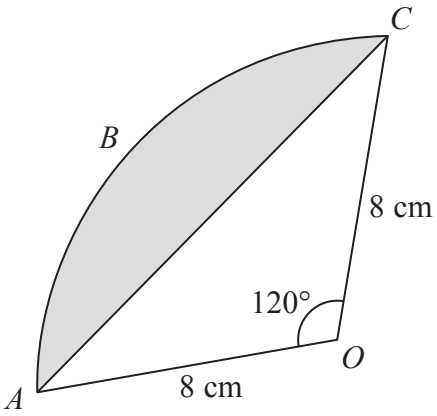


Diagram **NOT** accurately drawn

ABC is an arc of a circle with centre *O* and radius 8 cm.
AC is a chord of the circle.
Angle *AOC* = 120°

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

..... cm

19. **[5 marks]**

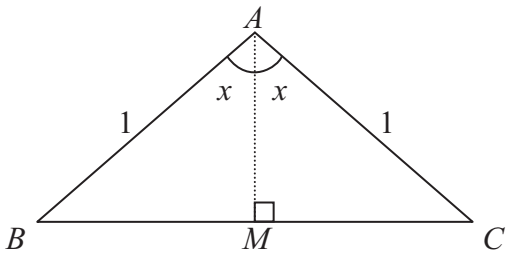


Diagram **NOT** accurately drawn

ABC is an isosceles triangle.
$AB = AC = 1$
M is the midpoint of *BC*.

(a) (i) Use trigonometry to find an expression, in terms of x, for *BM*.

.....

(ii) Hence write down an expression, in terms of x, for *BC*.

.....

(2)

(b) Use the cosine rule to find an expression, in terms of $\cos(2x)$, for BC^2.

.....

(1)

(c) Hence show that $\cos(2x) = 1 - 2(\sin x)^2$

(2)