3.1 Basic Trigonometry

Question Paper

Course	Edexcel IAL Maths: Pure 1
Section	3. Trigonometry
Topic	3.1 Basic Trigonometry
Difficulty	V. Hard

Time allowed: **60**

Score: **/51**

Percentage: **/100**

Question 1

An isosceles triangle has side lengths 7.3 cm and 9.8 cm. Calculate the difference between the two possible smallest angles.

[4 marks]

Question 2

A triangle ABC has side lengths $AB = 3x$ cm, $BC = 5x$ cm and $AC = 6x$ cm.

(a) Calculate the size of the angle BAC to two decimal places.

[2 marks]

Question 2

(b) Given that the total perimeter of the triangle is 37.8 cm, find the area of the triangle, correct to three significant figures.

[4 marks]

Question 3

In a triangle ABC, $AB = 2x$ cm, $BC = 10$ cm and $AC = (20 - 2x)$ cm, angle $ABC = \theta°$.

(a) Show that $\cos\theta = \frac{4x - 15}{2x}$.

[2 marks]

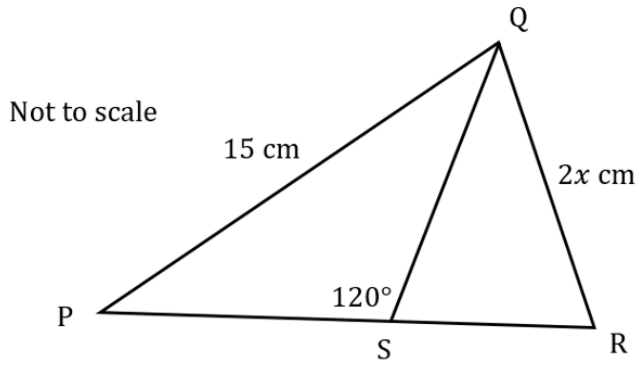
Question 3

(b) Given that $\cos\theta = -\frac{1}{2}$, find the area of the triangle.

[4 marks]

Question 4

Triangle PSQ and SQR are such that $PS = SQ = QR$. Sides $PQ = 15$ cm and $QR = 2x$ cm. Angle $PSQ = 120°$.



(a) Calculate the exact value of x.

[3 marks]

Question 4

(b) Calculate the area of the triangle PQR. Leaving your answer in surd form.

[2 marks]

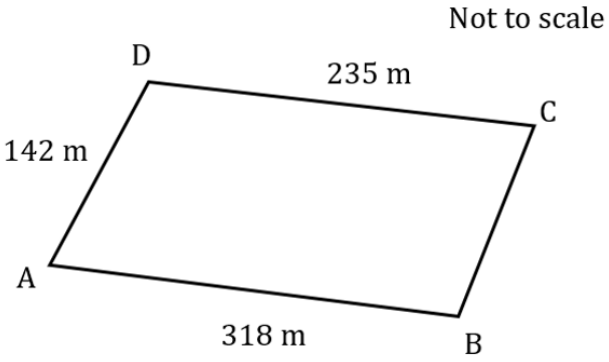
Question 5

An artist is designing a triangular sculpture, made using three equal lengths of metal piping. When laid flat the sculpture covers 21.8 m^2.
Calculate the total length of metal piping needed. Giving your answer to the nearest cm.

[5 marks]

Question 6

Unicorns are kept in a field as shown in the diagram below. The angle between fence AB and AD is 92°. AB and CD are parallel.



To be happy unicorns need at least 2222 m^2 each. Calculate the maximum number of unicorns that can happily be kept in the field.

[9 marks]

Question 7

An emergency call is picked up by an ambulance and a police car about an accident. The police car is 15 miles due east of the ambulance and on a bearing of 038° from the accident. The ambulance is on a bearing of 325° from the accident.

(a) If both vehicles take the shortest distance to drive to the accident who will get there first? You must show all working.

[4 marks]

Question 7

(b) State one assumption you have made for your answer in part (a).

[1 mark]

Question 8

A triangle ABC has sides $AB = x$ cm, $BC = (4 - x)$ cm, angle $BAC = \theta$ and angle $BCA = 30°$.

Given that $sin\ \theta = \frac{1}{\sqrt{2}}$, show that $x = 4(\sqrt{2} - 1)$.

[5 marks]

Question 9

A triangle ABC has sides $AB = 3x$ cm, $AC = (x + 5)$ cm and angle $BAC = 150°$.
The area of the triangle is $7\frac{1}{4}$ cm^2.

Find the ratio of the angles of the triangle, to the nearest degree.
Leave your answer in simplest form.

[6 marks]