HIGHER

7.11 Finding the Area of Any Triangle: 30-minute Pack

Total Marks

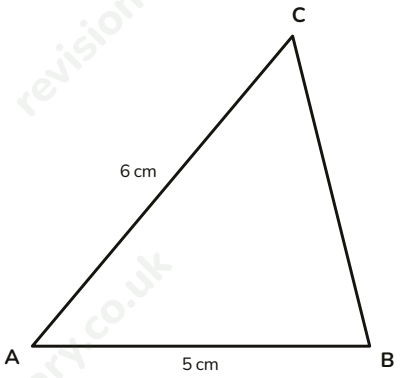
EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The area of triangle ABC is 10 cm². Side AB = 5 cm and side AC = 6 cm. Angle A is acute. Work out the size of angle A. Give your answer to the nearest degree.

Diagram NOT accurately drawn



(Total for Question 1 is 3 marks)

2 The area of a triangle is 28 cm². One side is 9 cm and the included angle is 50 degrees. Work out the length of the other side, correct to 2 decimal places.

(Total for Question 2 is 3 marks)

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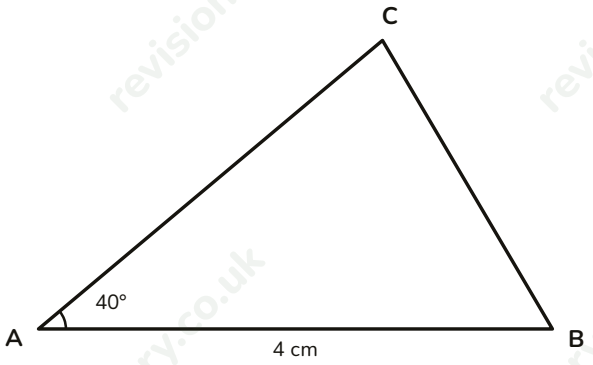
3 A triangular sail has sides 6.5 m and 4.2 m with included angle 37 degrees. Calculate the area of the sail, giving your answer to 2 decimal places.

(Total for Question 3 is 3 marks)

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4 A triangle has area 15 cm². One side is 4 cm and the included angle is 40 degrees. Work out the length of the other side, correct to 2 decimal places.

Diagram NOT accurately drawn



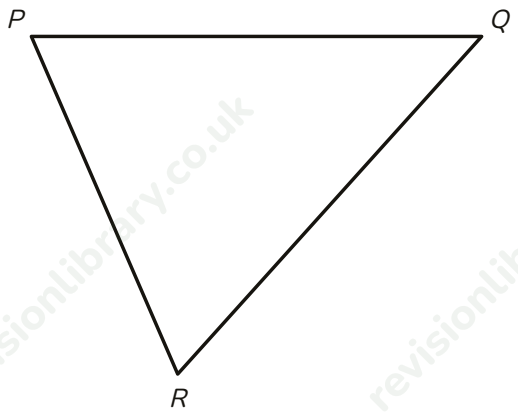
(Total for Question 4 is 3 marks)

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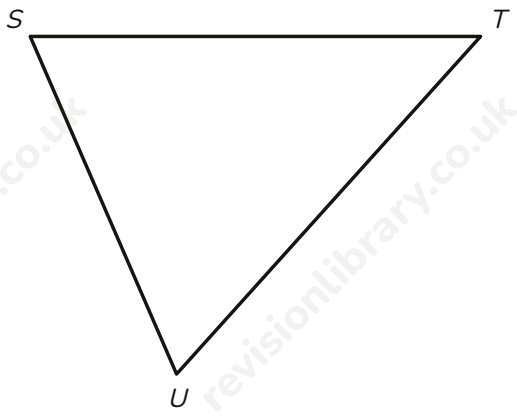
5 Triangle PQR has an area of 48 cm². Triangle STU is similar to triangle PQR, and each side of STU is 1.5 times the length of the corresponding side of PQR. Work out the area of triangle STU.

Diagram NOT accurately drawn

48 cm²



1.5 times corresponding sides



(Total for Question 5 is 3 marks)

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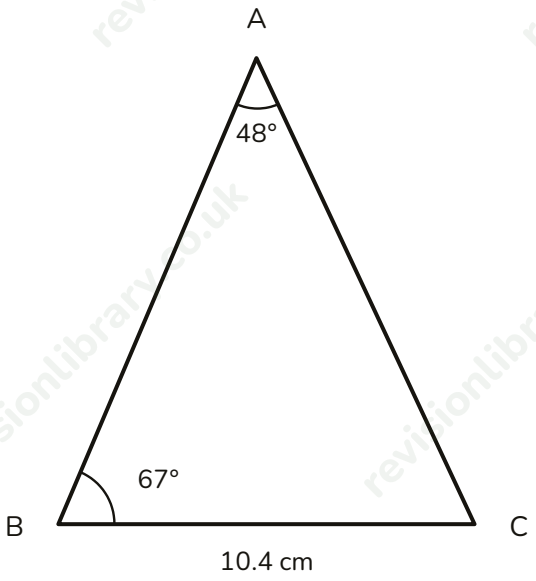
6 In a triangle, two sides are 8 cm and 13 cm and the area is 26 cm². Find all possible measures of the included angle x, in degrees.

(Total for Question 6 is 3 marks)

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7 In triangle ABC, angle BAC = 48 degrees, angle ABC = 67 degrees and BC = 10.4 cm (BC is opposite angle A). Calculate the area of triangle ABC. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn



(Total for Question 7 is 5 marks)

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Mark scheme · 7.11 Finding the Area of Any Triangle: 30-minute Pack

Question 1

use 1/2 * 5 * 6 * sin A = 10 and form sin A = 2*area/(ab) = 20/30 = 2/3	**M1**
take arcsin: A = arcsin(2/3) oe	**M1**
42 degrees cao	**A1**

Answer: 42 degrees

Question 2

use 1/2 * 9 * b * sin50 = 28 and rearrange to b = 56 / (9 sin50)	**M1**
substitute and evaluate denominator correctly oe	**M1**
8.12 cm cao	**A1**

Answer: 8.12 cm

Question 3

use 1/2 * 6.5 * 4.2 * sin37 or equivalent substitution	**M1**
evaluate sin37 and multiply correctly	**M1**
8.21 m² cao	**A1**

Answer: 8.21 m^2

Question 4

rearrange 1/2 * 4 * b * sin40 = 15 to b = 30 / (4 sin40) or equivalent	**M1**
substitute value for sin40 and evaluate numerator/denominator correctly	**M1**
11.67 cm cao	**A1**

Answer: 11.67 cm

Question 5

area scale factor = 1.5^2 (=2.25) identified	**B1**
48 x 2.25	**M1**
108 cm² cao	**A1**

Answer: 108 cm^2

Question 6

use 1/2 * 8 * 13 * sin x = 26 so sin x = 26/52 = 0.5	**M1**
know that sin x = 0.5 gives x = 30 degrees or x = 150 degrees oe	**M1**
30 degrees and 150 degrees cao	**A1**

Answer: 30 degrees or 150 degrees

Question 7

angle C = 180 - 48 - 67 (=65 degrees)	**M1**
AC / sin67 = 10.4 / sin48 (sine rule) oe	**M1**
AC = 12.9 cm awrt	**A1**
1/2 x 10.4 x AC x sin65 oe (ft their AC)	**M1**
60.7 cm² awrt	**A1**

Answer: 60.7 cm^2 (3 sf)

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