HIGHER

7.11 Finding the Area of Any Triangle: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

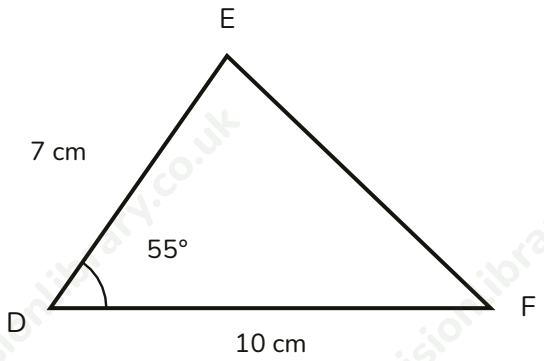
Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 In triangle DEF, DE = 7 cm, DF = 10 cm and angle EDF = 55 degrees. Calculate the area of triangle DEF. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn

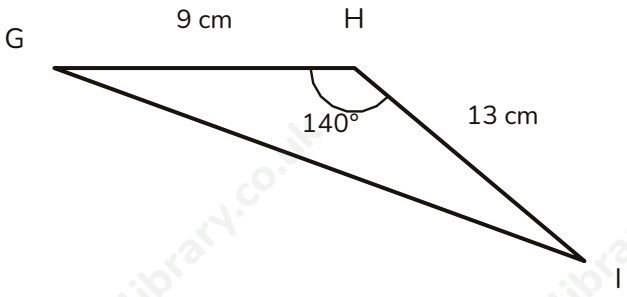


(Total for Question 1 is 3 marks)

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2 In triangle GHI, GH = 9 cm, HI = 13 cm and angle GHI = 140 degrees. Calculate the area of triangle GHI. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn

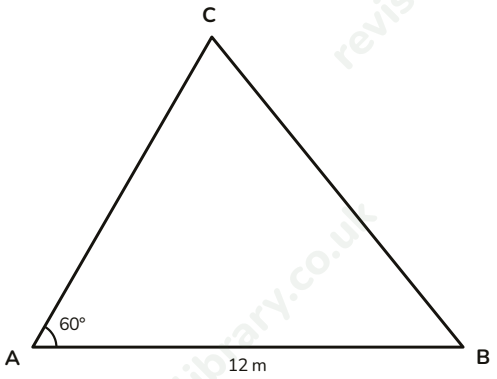


(Total for Question 2 is 3 marks)

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3 Triangle ABC has AB = 12 m, angle A = 60 degrees and area 84 m². Work out AC, correct to 2 decimal places.

Diagram NOT accurately drawn



(Total for Question 3 is 5 marks)

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4 A triangular garden has sides 7.5 m and 11.2 m with included angle 142 degrees.

(a) Calculate the area to 2 decimal places. **(3)**

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(b) Calculate the cost of turf at £3.50 per m^2 to the nearest penny. **(2)**

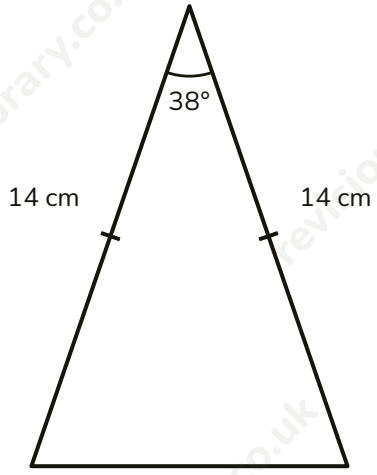
.....

(Total for Question 4 is 5 marks)

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5 An isosceles triangle has two equal sides of length 14 cm, with an apex angle of 38 degrees between them. Calculate the area of the triangle. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn

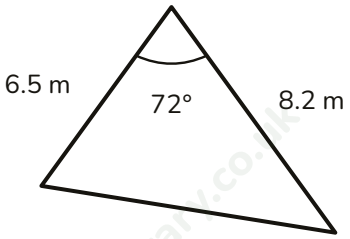


(Total for Question 5 is 3 marks)

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6 A triangular flower bed has two sides of length 6.5 m and 8.2 m, with an included angle of 72 degrees between them. Turf costs £12.50 per square metre. Work out the total cost of turfing the flower bed. Give your answer to the nearest penny.

Diagram NOT accurately drawn

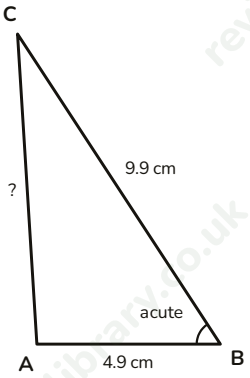


(Total for Question 6 is 4 marks)

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7 The area of triangle ABC is 20.3 cm². AB = 4.9 cm and BC = 9.9 cm. Angle ABC is acute. Work out the size of angle ABC. Give your answer correct to 1 decimal place.

Diagram NOT accurately drawn

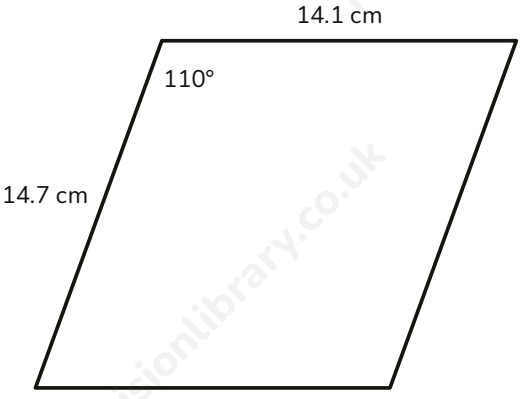


(Total for Question 7 is 3 marks)

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8 A parallelogram has sides of length 14.1 cm and 14.7 cm. The angle between these two sides is 110 degrees. Work out the area of the parallelogram. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn

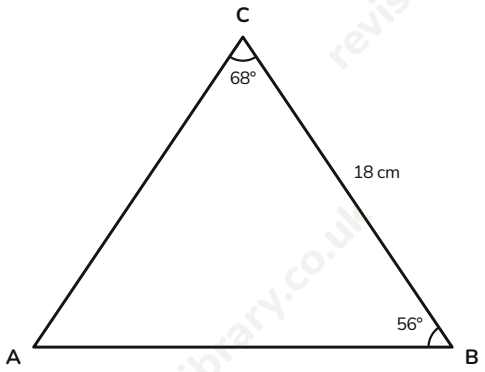


(Total for Question 8 is 2 marks)

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9 In triangle ABC, BC = 18 cm, angle ABC = 56 degrees and angle ACB = 68 degrees. Work out the area of triangle ABC. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn

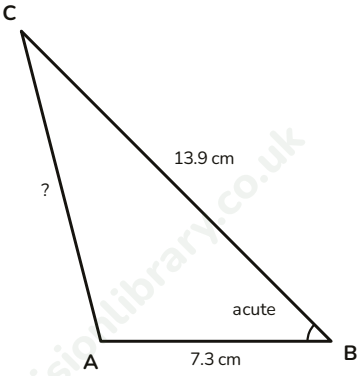


(Total for Question 9 is 4 marks)

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10 The area of triangle ABC is 35.9 cm². AB = 7.3 cm and BC = 13.9 cm. Angle ABC is acute. Work out the size of angle ABC. Give your answer correct to 1 decimal place.

Diagram NOT accurately drawn

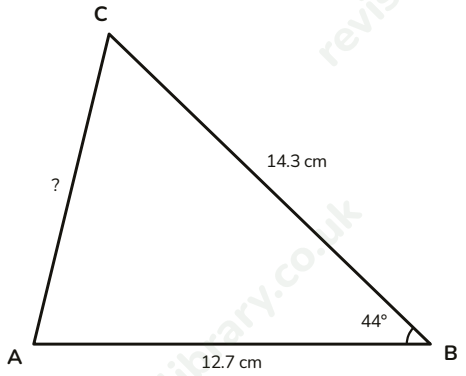


(Total for Question 10 is 3 marks)

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11 In triangle ABC, AB = 12.7 cm, BC = 14.3 cm and angle ABC = 44 degrees. Work out the area of the triangle. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn

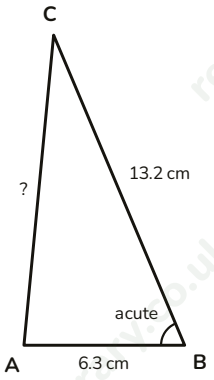


(Total for Question 11 is 2 marks)

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12 The area of triangle ABC is 38.3 cm². AB = 6.3 cm and BC = 13.2 cm. Angle ABC is acute. Work out the size of angle ABC. Give your answer correct to 1 decimal place.

Diagram NOT accurately drawn

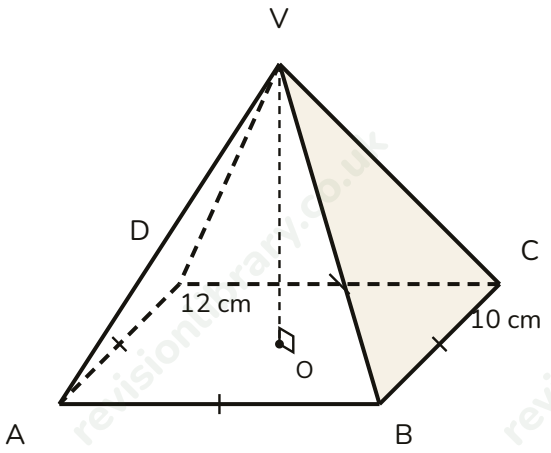


(Total for Question 12 is 3 marks)

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13 A pyramid VABCD has a square base ABCD with side length 10 cm. The apex V is directly above the centre of the base, and the vertical height of the pyramid is 12 cm. Calculate the area of the triangular face VBC.

Diagram NOT accurately drawn



(Total for Question 13 is 5 marks)

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Mark scheme · 7.11 Finding the Area of Any Triangle: 1-hour Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

1/2 x 7 x 10 x sin55 oe	**M1**
35 sin55 (= 28.6703...); accept a value that rounds to 28.7 cm² to 3 significant figures	**A1**
28.7 cm² awrt	**A1**

Answer: 28.7 cm^2 (3 sf)

Question 2

1/2 x 9 x 13 x sin140 oe	**M1**
58.5 sin140 seen	**A1**
37.6 cm² awrt	**A1**

Answer: 37.6 cm^2 (3 sf)

Question 3

use 1/2 * AB * AC * sin A = area	**M1**
substitute: 1/2 * 12 * AC * sin60 = 84	**M1**
rearrange to AC = 84 / (0.5*12*sin60) or equivalent	**M1**
evaluate denominator correctly (sin60 = $\sqrt{3}/2$) and compute AC	**M1**
16.17 m cao	**A1**

Answer: 16.17 m

Question 4

(a) use 1/2 * 7.5 * 11.2 * sin142	**M1**
(a) evaluate sin142 correctly (sin142 = sin38) and multiply	**M1**
(a) 25.86 m² awrt	**A1**

(a) Answer: 25.86 m^2

(b) multiply the exact area (25.8578 m²) by 3.50	**M1**
(b) £90.50 cao	**A1**

(b) Answer: £90.50

Question 5

1/2 x 14 x 14 x sin38 oe	**M1**
98 sin38 seen	**M1**
60.3 cm² awrt	**A1**

Answer: 60.3 cm^2 (3 sf)

Question 6

1/2 x 6.5 x 8.2 x sin72 oe	**M1**
25.3 m² awrt (area)	**A1**
area x 12.50	**M1**
£316.82 awrt (ft from their area)	**A1**

Answer: £316.82

Question 7

20.3 = 1/2 x 4.9 x 9.9 x sin B	**M1**
sin B = 0.8369 or inverse sin used	**M1**
56.8 degrees cao	**A1**

Answer: 56.8 degrees

Question 8

uses ab sin C or twice the area of a triangle	**M1**
195 cm² cao	**A1**

Answer: 195 cm^2

Question 9

angle BAC = 56 degrees	**M1**
sine rule used to find AC or AB	**M1**
area = 1/2 ab sin C with correct values	**M1**
150 cm² cao	**A1**

Answer: 150 cm^2

Question 10

35.9 = 1/2 x 7.3 x 13.9 x sin B	**M1**
sin B = 0.7076 or inverse sin used	**M1**
45.0 degrees cao	**A1**

Answer: 45.0 degrees

Question 11

1/2 x a x b x sin C with correct values	**M1**
63.1 cm² cao	**A1**

Answer: 63.1 cm^2

Question 12

38.3 = 1/2 x 6.3 x 13.2 x sin B	**M1**
sin B = 0.9211 or inverse sin used	**M1**
67.1 degrees cao	**A1**

Answer: 67.1 degrees

Question 13

identifies right-angled triangle formed by the vertical height, half the base edge (5 cm) and the slant height	**M1**
$slant^2 = 12^2 + 5^2$ (Pythagoras)	**M1**
slant height = 13 cm cao	**A1**
1/2 x 10 x 13	**M1**
65 cm² cao	**A1**

Answer: 65 cm^2

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