3.18 Area of Compound Shapes: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A rectangle measures 10 cm by 6 cm. A small rectangle of size 3 cm by 2 cm has been removed from one corner. Work out the area of the remaining shape.

(Total for Question 1 is 2 marks)

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2 A rectangle is 12 cm by 5 cm. A square of side 3 cm is removed from one corner. Work out the area of the shape left.

(Total for Question 2 is 2 marks)

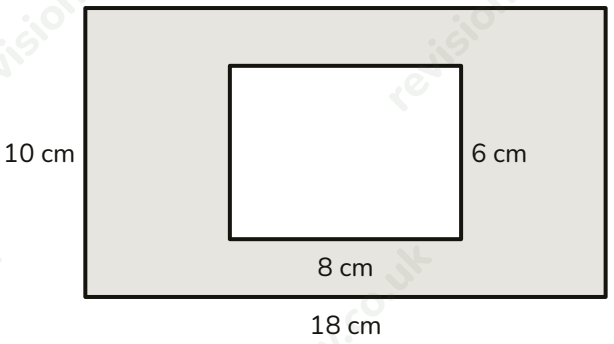
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3 A rectangle measures 12 cm by 9 cm. A smaller rectangle of size 4 cm by 3 cm inside it is shaded. Work out the area of the unshaded part of the rectangle.

(Total for Question 3 is 2 marks)

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4 A large rectangle is 18 cm by 10 cm. A central rectangle of 8 cm by 6 cm is not shaded. Find the area of the shaded part of the large rectangle.



(Total for Question 4 is 3 marks)

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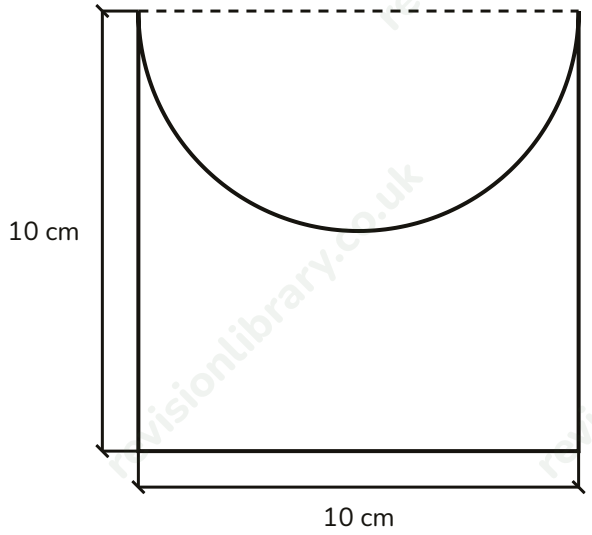
5 A garden is made from a large rectangle 8.0 m by 5.0 m. A small rectangular pond 3.0 m by 2.0 m is removed from one corner. A triangular flowerbed with base 4.0 m and height 1.5 m is added along one long edge of the large rectangle. Work out the total area of the garden.

(Total for Question 5 is 6 marks)

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6 A composite shape is formed by removing a semicircular notch from a square of side 10 cm. The diameter of the semicircle equals the side of the square. Calculate the area of the remaining shape. Give your answer in terms of π and as a decimal to 1 decimal place.

Diagram NOT accurately drawn



(Total for Question 6 is 4 marks)

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7 A rectangular garden is 14 m by 10 m. A path of uniform width x metres runs all the way around the inside of the garden, leaving a rectangular lawn in the centre. The area of the lawn is 84 m².

Find the width of the path. Give the exact value and a decimal approximation to 2 decimal places.

(Total for Question 7 is 5 marks)

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Mark scheme · 3.18 Area of Compound Shapes: 30-minute Pack

Question 1

60 - 3×2, or equivalent subtraction method	**M1**
54 cm² cao	**A1**

Answer: 54 cm^2

Question 2

60 - 3×3, or equivalent subtraction method	**M1**
51 cm² cao	**A1**

Answer: 51 cm^2

Question 3

108 - 4×3, or equivalent subtraction	**M1**
96 cm² cao	**A1**

Answer: 96 cm^2

Question 4

use 18×10 - 8×6 or equivalent subtraction method	**M1**
compute 180 - 48	**M1**
132 cm² cao	**A1**

Answer: 132 cm^2

Question 5

area large rectangle = 8.0 * 5.0 = 40.0 m²	**M1**
area pond = 3.0 * 2.0 = 6.0 m²	**M1**
area triangle = 1/2 * 4.0 * 1.5 = 3.0 m²	**M1**
subtract pond: 40.0 - 6.0 = 34.0 m²	**A1**
add triangle: 34.0 + 3.0 = 37.0 m²	**A1**
37.0 m² cao	**A1**

Answer: 37.0 m^2

Question 6

area square = 10^2 = 100, area semicircle = 1/2 * π * $(5)^2$ = 12.5pi	**M1**
subtract: area = 100 - 12.5pi	**M1**
exact area 100 - 12.5pi cao	**A1**
decimal: 100 - 12.5pi = 100 - 39.2699... = 60.7 cm² (1 d.p.)	**A1**

Answer:Exact: 100 - 12.5pi cm^2. Decimal: 60.7 cm^2 (1 d.p.). Working check: 12.5pi = 39.2699..., 100 - 39.2699... = 60.730... -> 60.7 (1 d.p.).

Question 7

form equation (14 - 2x)(10 - 2x) = 84 or equivalent	**M1**
expand/rearrange to a quadratic: $4x^2$ - 48x + 56 = 0 (or divide by 4: x^2 - 12x + 14 = 0)	**M1**
use quadratic formula to find x = 6 ± $\sqrt{22}$ (evidence of correct substitution)	**M1**
exact width x = 6 - $\sqrt{22}$ m cao (smaller positive root)	**A1**
decimal answer x approx 1.31 m awrt (6 - $\sqrt{22}$ approx 1.3096...)	**A1**

Answer: Exact: x = 6 - $\sqrt{22}$ m. Decimal: x approx 1.31 m (to 2 d.p.)

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