Year 8 area of composite shapes worksheet

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Name: _____ Date: _____

Question 1

A composite shape is made by starting with a rectangle that is 10 cm wide and 8 cm tall, then removing a smaller rectangle from the top-right corner that is 4 cm wide and 3 cm tall. Find the area of the composite shape.

Answer: _____

Question 2

A family wants to pave an L-shaped courtyard. The courtyard can be thought of as a large rectangle 9 m wide and 6 m long, with a rectangular section 3 m wide and 4 m long removed from one corner. Paving costs $35 per square metre. Find the total cost to pave the courtyard.

Answer: _____

Question 3

An L-shaped room has a large rectangle measuring 10 m by 6 m, with a rectangular section of 4 m by 3 m removed from one corner. What is the area of the room in square metres?

Answer: _____

Question 4

A composite shape is made by starting with a rectangle that is 12 m wide and 7 m tall, then removing a rectangle from the top-left corner that is 4 m wide and 3 m tall. Find the area of the composite shape.

Answer: _____

Question 5

A shape is made from a rectangle and a semicircle. The rectangle is 10 cm long and 6 cm wide. The semicircle sits on top of one of the 6 cm sides, with that side as its diameter. Find the total area of the shape, correct to one decimal place.

Answer: _____

Question 6

A gardener wants to put a circular garden bed in a park. The garden bed has a radius of 3 m, and there is a circular path 1 m wide that runs around the outside of it, forming a

larger circle with radius 4 m. The garden bed will be planted with flowers, and the path will be paved. Find the area of the path only, correct to two decimal places.

Answer: _____

Question 7

A shape is made by cutting a quadrant (quarter circle) from a square. The square has a side length of 8 cm. The quadrant has its corner at one corner of the square, and its radius equals the side length of the square, so r = 8 cm. Find the area of the shape that remains after the quadrant is removed. Give your answer correct to one decimal place.

Answer: _____

Question 8

An L-shaped room is made by taking a rectangle 10 m long and 8 m wide and removing a rectangle 4 m long and 3 m wide from one corner.

(a) Find the floor area of the room.

(b) Find the perimeter of the room.

Answer: _____

Question 9

A shape is made from a square with sides of 6 cm and an isosceles triangle sitting on top of it. The base of the triangle is the top side of the square. The triangle has a perpendicular height of 4 cm and its two equal sides are each 5 cm long.

(a) Find the area of the shape.

(b) Find the perimeter of the shape.

Answer: _____

Question 10

A rectangular lawn measures 12 m by 8 m. A path 1 m wide runs all the way around the outside of the lawn.

(a) Find the area of the path.

(b) Find the perimeter of the outer edge of the path.

Answer: _____

Year 8 area of composite shapes: answers and worked solutions

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Question 1

Key idea: Use the subtraction method, find the area of the whole rectangle, then subtract the cut-out rectangle.

1. Area of the whole rectangle:\ 10 × 8 = 80 cm² 2. Area of the cut-out rectangle:\ 4 × 3 = 12 cm² 3. Subtract to find the composite area:\ 80 - 12 = 68 cm²

Answer: The area of the composite shape is 68 cm².

Question 2

Key idea: Find the area of the L-shape using the subtraction method, then multiply by the cost per square metre.

1. Area of the large rectangle:\ 9 × 6 = 54 m² 2. Area of the removed section:\ 3 × 4 = 12 m² 3. Area of the L-shaped courtyard:\ 54 - 12 = 42 m² 4. Total cost:\ 42 × 35 = 1470

Answer: The total cost to pave the courtyard is $1470.

Question 3

Key idea: Use the subtraction method: area of composite shape = area of whole rectangle minus area of the cut-out.

1. Find the area of the full large rectangle: 10 × 6 = 60 m² 2. Find the area of the removed corner rectangle: 4 × 3 = 12 m² 3. Subtract: 60 - 12 = 48 m²

Answer: 48 m²

Question 4

Key idea: Use the subtraction method, find the area of the whole rectangle, then subtract the cut-out.

1. Area of the whole rectangle:\ 12 × 7 = 84 m² 2. Area of the cut-out rectangle:\ 4 × 3 = 12 m² 3. Area of the composite shape:\ 84 - 12 = 72 m²

Answer: The area of the composite shape is 72 m².

Question 5

Key idea: The total area is the area of the rectangle plus the area of the semicircle. The semicircle has diameter 6 cm, so its radius is 3 cm.

1. Find the radius of the semicircle: r = 6 ÷ 2 = 3 cm. 2. Find the area of the rectangle:\ A_(rect) = 10 × 6 = 60 cm² 3. Find the area of the semicircle:\ A_{semi} = ½π r² = ½ × π × 3² = (9π)/(2) ≈ 14.1 cm² 4. Add the areas:\ A_{total} = 60 + 14.1 = 74.1 cm²

Answer: Total area ≈ 74.1 cm²

Question 6

Key idea: The path is an annulus (a ring shape). Its area equals the area of the large circle minus the area of the small circle.

1. Write the radii: outer radius R = 4 m, inner radius r = 3 m. 2. Find the area of the large circle:\ A_(large) = π R² = π × 4² = 16π m² 3. Find the area of the small circle:\ A_{small} = π r² = π × 3² = 9π m² 4. Find the area of the path:\ A_{path} = 16π - 9π = 7π ≈ 21.99 m²

Answer: The area of the path is ≈ 21.99 m²

Question 7

Key idea: Subtract the area of the quadrant from the area of the square.

1. Find the area of the square:\ A_(square) = 8² = 64 cm² 2. Find the area of the quadrant (radius r = 8 cm):\ A_(quadrant) = ¼π r² = ¼ × π × 8² = (64π)/(4) = 16π ≈ 50.3 cm² 3. Subtract to find the remaining area:\ A = 64 - 16π ≈ 64 - 50.3 = 13.7 cm²

Answer: Area ≈ 13.7 cm²

Question 8

Answer: (a) 68 m² (80 - 12) (b) 36 m (the same as the full rectangle, 2 × (10 + 8))

Question 9

Answer: (a) 48 cm² (36 + 12) (b) 28 cm (6 + 6 + 6 + 5 + 5)

Question 10

Answer: (a) 44 m² (14 × 10 - 12 × 8) (b) 48 m