Year 9 area of composite shapes worksheet

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Name: _____ Date: _____

Question 1

The front wall of a garden shed is a rectangle 8 m wide and 3 m high, with a triangle on top that has a base of 8 m and a perpendicular height of 2.5 m. Find the total area of the front wall.

Answer: _____

Question 2

A shape is made from a rectangle 10 cm long and 6 cm wide, with a semicircle attached to one of its 6 cm sides (the semicircle has diameter 6 cm). Find, correct to 2 decimal places:

(a) the perimeter of the shape

(b) the area of the shape

Answer: _____

Question 3

A square tile has sides of 10 cm. A circular hole with a radius of 3 cm is cut from its centre. Find the area of the tile that remains, correct to 2 decimal places.

Answer: _____

Question 4

A rectangular lawn is 8 m long and 5 m wide. A path 1 m wide is built around the outside of the lawn. Find the area of the path.

Answer: _____

Question 5

A window is a rectangle 1.2 m wide and 1.5 m tall, with a semicircle on top whose diameter is the 1.2 m top edge of the rectangle.

(a) Find the area of glass in the window, correct to 2 decimal places.

(b) Find the length of the frame around the outside edge of the window, correct to 2 decimal places.

(c) Glass costs $85 per square metre. Find the cost of the glass, to the nearest cent.

Answer: _____

Question 6

A rectangular sheet of metal is 12 cm by 8 cm. A square of side 2 cm is cut from each corner. Find the area of metal that remains.

Answer: _____

Year 9 area of composite shapes: answers and worked solutions

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Question 1

Key idea: Split the composite shape into simple shapes, find each area, then add.

1. Rectangle: 8 × 3 = 24 2. Triangle: ½ × 8 × 2.5 = 10 3. Total: 24 + 10 = 34

Answer: 34 m²

Question 2

Key idea: The side where the semicircle is attached is inside the shape, so it is not part of the perimeter. The curved part is half a circumference.

1. (a) Straight sides: 10 + 10 + 6 = 26 2. (a) Semicircle arc: ½ × π × 6 = 3π 3. (a) Perimeter = 26 + 3π = 35.424… ≈ 35.42 4. (b) Rectangle: 60; semicircle: ½ × π × 3² = 4.5π 5. (b) Area = 60 + 4.5π = 74.137… ≈ 74.14

Answer: (a) 35.42 cm (b) 74.14 cm²

Question 3

Key idea: For a shape with a piece removed, subtract the area of the piece from the area of the whole shape.

1. Square: 10 × 10 = 100 2. Hole: π × 3² = 9π 3. Remaining: 100 - 9π = 71.725… ≈ 71.73

Answer: 71.73 cm²

Question 4

Key idea: The path area is the area of the large rectangle (lawn and path) minus the area of the lawn.

1. The path adds 1 m on each side, so the large rectangle is (8 + 2) m by (5 + 2) m = 10 m by 7 m 2. Large rectangle: 10 × 7 = 70; lawn: 8 × 5 = 40 3. Path: 70 - 40 = 30

Answer: 30 m²

Question 5

Key idea: Add the rectangle and semicircle areas. The outside edge has three straight sides and the semicircular arc; the top of the rectangle is inside the window.

1. (a) Rectangle: $1.2 \times 1.5 = 1.8$; semicircle: $\frac{1}{2} \times \pi \times 0.6^2 = 0.18\pi$ 2. (a) Area = $1.8 + 0.18\pi = 2.365\ldots \approx 2.37$ 3. (b) Straight sides: $1.5 + 1.5 + 1.2 = 4.2$; arc: $\frac{1}{2} \times \pi \times 1.2 = 0.6\pi$ 4. (b) Frame = $4.2 + 0.6\pi = 6.084\ldots \approx 6.08$ 5. (c) Using the unrounded area: $85 \times 2.36548\ldots = 201.066\ldots \approx 201.07$

Answer: (a) 2.37 m^2 (b) 6.08 m (c) $201.07

Question 6

Key idea: Subtract the areas of the removed pieces from the area of the whole sheet.

1. Sheet: $12 \times 8 = 96$ cm^2 2. Removed: $4 \times 2^2 = 16$ cm^2 3. Remaining: $96 - 16 = 80$ cm^2

Answer: 80 cm^2