Year 7 area and perimeter worksheet

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Name: _____ Date: _____

Question 1

Find the perimeter of a rectangle that is 14 cm long and 9 cm wide.

Answer: _____

Question 2

A circle has a diameter of 10 cm. Calculate its circumference. Use $\pi \approx 3.14$ and give your answer rounded to one decimal place.

Answer: _____

Question 3

A sector is a quarter of a circle with radius 8 m.

(a) Find the exact length of its arc, in terms of π.

(b) Find its perimeter, using $\pi \approx 3.14$.

Answer: _____

Question 4

A rectangular room is 7 m long and 4 m wide. What is the area of the room in square metres?

Answer: _____

Question 5

Mia is setting up a vegetable garden in her backyard. The garden is in the shape of a parallelogram with a base of 6 m and a perpendicular height of 3.5 m. She also wants to put a fence all the way around the garden. The parallelogram has two sides of length 6 m and two sides of length 4 m. Fencing costs $12 per metre and soil costs $8 per square metre. How much will Mia spend in total?

Answer: _____

Question 6

Find the area of a triangle with a base of 8 cm and a perpendicular height of 5 cm.

Answer: _____

Question 7

A compound shape is made by joining a rectangle and a square. The rectangle is 10 m long and 4 m wide. The square has a side length of 4 m and is attached to the right end of the rectangle, so the two shapes share one 4 m edge. Find the total perimeter and total area of the compound shape.

Answer: _____

Question 8

A square has a perimeter of 52 m. Find its side length.

Answer: _____

Question 9

A circle has a circumference of 94.2 cm. Find its radius. Use $\pi \approx 3.14$.

Answer: _____

Question 10

A running track is made of a rectangle 100 m long and 60 m wide, with a semicircle attached to each of the two 60 m ends (the semicircles have diameter 60 m). The track runs around the outside of the shape, so the 60 m ends are not part of it.

(a) Find the exact perimeter in terms of π.

(b) Use $\pi \approx 3.14$ to find the perimeter to one decimal place.

(c) About how many laps are needed to run at least 2 km?

Answer: _____

Year 7 area and perimeter: answers and worked solutions

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Question 1

Key idea: Perimeter of a rectangle = 2 × length + 2 × width.

1. 2 × 14 + 2 × 9 = 28 + 18 = 46 cm

Answer: 46 cm

Question 2

Key idea: The circumference of a circle is C = π d, where d is the diameter.

1. Write the formula: C = π d 2. Substitute d = 10 and π ≈ 3.14:\ C = 3.14 × 10 3. Calculate:\ C = 31.4 cm

Answer: The circumference is 31.4 cm.

Question 3

Key idea: The arc of a quarter circle is ¼ of the circumference 2π r. The perimeter of a sector is the arc plus two radii.

1. (a) Arc = ¼ × 2 × π × 8 = 4π m 2. (b) 4π ≈ 4 × 3.14 = 12.56 m 3. (b) Perimeter = 12.56 + 8 + 8 = 28.56 m

Answer: (a) 4π m (b) 28.56 m

Question 4

Key idea: Area of a rectangle = length × width

1. Write the formula: A = l × w 2. Substitute the values: A = 7 × 4 3. Calculate: A = 28

Answer: 28 m²

Question 5

Key idea: Use the parallelogram area formula for the soil cost and the perimeter for the fencing cost, then add both costs.

1. Find the area of the garden: A = b × h = 6 × 3.5 = 21 m² 2. Find the perimeter of the garden: P = 2 × (6 + 4) = 2 × 10 = 20 m 3. Calculate the cost of soil: 21 × 8 = $168 4. Calculate the cost of fencing: 20 × 12 = $240 5. Find the total cost: 168 + 240 = $408

Answer: Mia will spend $408 in total.

Question 6

Key idea: The area of a triangle is A = ½ × b × h, where b is the base and h is the perpendicular height.

1. Write the formula: A = ½ × b × h 2. Substitute b = 8 and h = 5: A = ½ × 8 × 5 3. Calculate: A = ½ × 40 = 20

Answer: The area of the triangle is 20 cm².

Question 7

Key idea: For a compound shape, split it into simpler shapes to find the area, and trace the outside edges carefully to find the perimeter.

1. Find the area of the rectangle: A_(rect) = 10 × 4 = 40 m² 2. Find the area of the square: A_(sq) = 4 × 4 = 16 m² 3. Add the areas: A_{total} = 40 + 16 = 56 m² 4. Trace the outside edges. The overall shape is a rectangle 14 m long and 4 m wide (the shared edge is internal, not on the boundary): P = 2 × (14 + 4) = 2 × 18 = 36 m

Answer: Total area = 56 m²; total perimeter = 36 m.

Question 8

Key idea: A square has four equal sides, so each side is the perimeter divided by 4.

1. 52 ÷ 4 = 13 m

Answer: 13 m

Question 9

Key idea: Use C = 2π r and rearrange to find r.

1. Write the formula: C = 2π r 2. Rearrange to make r the subject:\ r = (C)/(2π) 3. Substitute C = 94.2 and π ≈ 3.14:\ r = (94.2)/(2 × 3.14) = (94.2)/(6.28) 4. Calculate:\ r = 15 cm

Answer: The radius is 15 cm.

Question 10

Key idea: Two semicircles with the same diameter make one full circle, so their arcs add to π d.

1. (a) Straight sections: 2 × 100 = 200 m 2. (a) Two semicircles of diameter 60 m make a full circle: π × 60 = 60π m 3. (a) Perimeter = 200 + 60π m 4. (b) 60 × 3.14 = 188.4, so 200 + 188.4 = 388.4 m 5. (c) 5 laps = 5 × 388.4 = 1942 m, which is less than 2000 m; 6 laps = 2330.4 m, so 6 laps

Answer: (a) 200 + 60π m (b) 388.4 m (c) 6 laps