Answers - Perimeter and area

Year: Year 4

Answer to Question 1

a. 8 + 5 + 8 + 5 = **26 cm**.
b. 2 × (12 + 7) = 2 × 19 = **38 m**.
c. 4 × 9 = **36 cm**.
d. 2 × (15 + 9) = 2 × 24 = **48 cm**.

Answer to Question 2

a. The shape is 4 cm high on the right and the left side is 2 cm, so the step is 4 − 2 = **2 cm**.
b. Sides: 7 + 4 + 3 + 2 + 4 + 2 = **22 cm**.
c. The surrounding rectangle is 7 cm by 4 cm: 2 × (7 + 4) = **22 cm**, the same.

Answer to Question 3

a. 4 rows of 6 squares: 4 × 6 = **24 cm²**.
b. 7 rows of 3 squares: 7 × 3 = **21 cm²**.
c. The bottom part has 2 rows of 5 squares: 10 squares. The top part has 2 more rows of 2 squares: 4 squares. 10 + 4 = **14 cm²**.

Answer to Question 4

a. 9 × 4 = **36 cm²**.
b. 12 × 6 = **72 m²**.
c. 15 × 8 = **120 cm²** (10 × 8 = 80 and 5 × 8 = 40).
d. 11 × 11 = **121 m²**.

Answer to Question 5

a. 36 ÷ 9 = **4 cm**, because 9 × 4 = 36.
b. The two widths are 5 + 5 = 10 m, so the two lengths are 34 − 10 = 24 m. One length is 24 ÷ 2 = **12 m**.
c. 72 ÷ 8 = **9 m**, because 8 × 9 = 72.
d. 28 ÷ 4 = **7 cm**.

Answer to Question 6

a. Half of the perimeter is 12 cm, so width = 12 − length. Length 11: width 1 cm, area 11 cm². Length 9: width 3 cm, area 27 cm². Length 6: width 6 cm, area 36 cm². Table: **(1 cm, 11 cm²), (3 cm, 27 cm²), (6 cm, 36 cm²)**.
b. The biggest area is **36 cm²**, for the rectangle that is 6 cm by 6 cm: it is a **square**.
c. 11 cm² is much smaller than 36 cm². The difference is **25 cm²**, even though the perimeters are the same.

Answer to Question 7

a. 2 × (14 + 9) = 2 × 23 = **46 m**.
b. 46 ÷ 2 = **23 panels**.
c. 23 × £18 = **£414** (20 × 18 = 360 and 3 × 18 = 54).
d. A 2 m gap needs 1 panel less: **1 fewer**, so 22 panels cost 22 × £18 = **£396**.

Answer to Question 8

a. 5 × 4 = **20 m²**.
b. 20 × £12 = **£240**.
c. The perimeter is 2 × (5 + 4) = **18 m**.
d. 18 × £3 = **£54**.

Answer to Question 9

a. 20 × 15 = **300 cm²**.
b. 2 × (20 + 15) = **70 cm**.
c. 70 ÷ 10 = 7, so 7 × 20p = 140p = **£1.40**.
d. 25 × 25 = **625 cm²**. Not covered: 625 − 300 = **325 cm²**.

Answer to Question 10

a. 40 × 25 = **1 000 m²**.
b. 10 × 10 = **100 m²**.
c. 1 000 − 100 = **900 m²**.
d. The perimeter is 2 × (40 + 25) = 130 m, so twice is 2 × 130 = **260 m**.

Answer to Question 11

a. 3 × 2 = **6 m²**.

b. $6 \times 4 =$ **24 tiles**.
c. $24 \div 10 = 2$ remainder 4, so she needs **3 boxes** (30 tiles).
d. $3 \times £15 =$ **£45**. Tiles left over: $30 - 24 =$ **6 tiles**.

Answer to Question 12

a. Bed A: $8 \times 3 =$ **24 m²**. Bed B: $6 \times 4 =$ **24 m²**.
b. The areas are equal: **neither** is bigger (the difference is 0 m²).
c. Bed A: $2 \times (8 + 3) =$ **22 m**. Bed B: $2 \times (6 + 4) =$ **20 m**.
d. The areas are the same, so no bed has the bigger area. But Bed A has the bigger perimeter (22 m > 20 m). Two shapes with the same area can have **different perimeters**.

Answer to Question 13

a. $2 \times (60 + 40) =$ **200 m**.
b. $60 \times 40 =$ **2 400 m²**.
c. $2 \times (25 + 10) =$ **70 m**.
d. $70 \div 5 =$ **14 posts**.

Answer to Question 14

a. $4 \times 3 =$ **12 m²**.
b. $2 \times (4 + 3) =$ **14 m**.
c. $14 \times £5 =$ **£70**.
d. $12 \div 2 =$ **6 bags**.

Answer to Question 15

a. $8 + 3 + 4 + 3 + 4 + 6 =$ **28 m**. Check: surrounding rectangle 8 by 6 has perimeter $2 \times 14 = 28$ m.
b. Bottom rectangle: $8 \times 3 = 24$ m². Top rectangle: $4 \times 3 = 12$ m².
c. $24 + 12 =$ **36 m²**. Check: $8 \times 6 - 4 \times 3 = 48 - 12 = 36$ m².
d. $36 \times £14 =$ **£504** ($36 \times 10 = 360$ and $36 \times 4 = 144$).
e. $28 \times £4 =$ **£112**.

Answer to Question 16

a. The length plus the width is 12 m. The rectangles are: 11×1, 10×2, 9×3, 8×4, 7×5 and 6×6.
b. Areas: 11 m², 20 m², 27 m², 32 m², 35 m² and 36 m².

c. Biggest: **6 m by 6 m (36 m²)**, a square. Smallest: **11 m by 1 m (11 m²)**.
d. At least 30 m²: **8 × 4 (32), 7 × 5 (35) and 6 × 6 (36)**.
e. 8 m long means the width is 4 m: area 8 × 4 = 32 m². £128 ÷ 32 = **£4** per m².

Answer to Question 17

a. 4 × 3 = **12 m²**.
b. 2 × 1 = **2 m²**.
c. 12 − 2 = **10 m²**.
d. 10 ÷ 6 = 1 remainder 4, so 1 tin is not enough: he needs **2 tins**.
e. 2 × £8 = **£16**.

Answer to Question 18

a. Field A: 90 × 40 = **3 600 m²**. Field B: 60 × 60 = **3 600 m²**.
b. They are the **same**: the difference is 0 m².
c. Field A: 2 × (90 + 40) = **260 m**. Field B: 4 × 60 = **240 m**.
d. Field B is cheaper. The difference in perimeter is 260 − 240 = 20 m, so it saves 20 × £6 = **£120**.
e. Both fields have an area of 3 600 m². 3 600 ÷ 100 = **36 sheep**.

Answer to Question 19

a. 2 × (60 + 40) = 200 cm = **2 m**.
b. 8 × 2 = **16 m**.
c. 16 × £1.50 = **£24.00**.
d. Card: 8 × £0.80 = £6.40. Ribbon: £24.00. Total: **£30.40**.
e. £30.40 + £4.00 = £34.40, which is more than £25, so there is **no money left**: the council needs £9.40 more.

Answer to Question 20

a. Pairs of factors of 36: 1 × 36, 2 × 18, 3 × 12, 4 × 9, 6 × 6. Perimeters: 2 × (1 + 36) = 74 cm; 2 × (2 + 18) = 40 cm; 2 × (3 + 12) = 30 cm; 2 × (4 + 9) = 26 cm; 2 × (6 + 6) = 24 cm. There are **5 rectangles**: perimeters **74, 40, 30, 26 and 24 cm**.
b. The smallest perimeter is **24 cm**, for the 6 by 6 rectangle, which is a **square**.
c. He should use the 6 m by 6 m square. He needs **24 m** of fence.