

Chapter 11: Perimeter and Area

Warm-up

1. Total distance around the ground = $100\text{ m} + 75\text{ m} + 150\text{ m} + 100\text{ m} + 125\text{ m} + 200\text{ m} = \underline{750\text{ m}}$.
2. The distance around the ground is called Perimeter.

Exercise 11A

1. (a) Perimeter = $2\text{ cm} + 3\text{ cm} + 2\text{ cm} + 4\text{ cm} + 3\text{ cm} + 3\text{ cm} = 17\text{ cm}$
 (b) $P = 2\text{ cm} + 5\text{ cm} + 9\text{ cm} + 5\text{ cm} + 2\text{ cm} + 3\text{ cm} + 3\text{ cm} + 5\text{ cm} = 34\text{ cm}$
2. (a) $P = 16\text{ cm}$ (b) $P = 20\text{ cm}$ (c) $P = 18\text{ cm}$
3. (a) $P = 2\text{ cm} + \frac{1}{2}\text{ cm} + 1\text{ cm} + 1\text{ cm} + \frac{1}{2}\text{ cm} + 1\text{ cm} + 1\text{ cm} + \frac{1}{2}\text{ cm} + 3\text{ cm} + \frac{1}{2}\text{ cm} = 12\text{ cm}$
 (b) $P = 1\text{ cm} + 3\text{ cm} + 2\text{ cm} + 1\text{ cm} + 3\text{ cm} + 4\text{ cm} = 14\text{ cm}$
 (c) $P = 4\text{ cm} + 1\text{ cm} + \frac{1}{2}\text{ cm} + 3\text{ cm} + 1\text{ cm} + 3\text{ cm} + \frac{1}{2}\text{ cm} + 1\text{ cm} = 16\text{ cm}$
4. (a) $P = 5\text{ cm} + 4\text{ cm} + 6\text{ cm} = 15\text{ cm}$
 (b) $P = 34\text{ cm} + 41\text{ cm} + 39\text{ cm} = 114\text{ cm}$
5. $P = 7\text{ cm} + 7\text{ cm} + 7\text{ cm} = 21\text{ cm}$
6. Third side = $13\text{ cm} - (4\text{ cm} + 4\text{ cm}) = 13\text{ cm} - 8\text{ cm} = 5\text{ cm}$
7. Missing length = $22\text{ cm} - (6\text{ cm} + 4\text{ cm} + 3\text{ cm}) = 22\text{ cm} - 13\text{ cm} = 9\text{ cm}$
8. (d) $6 \times 5 = 30\text{ cm}$ 9. (c) $28 \times 2 = 56\text{ cm}$

Challenge!

- (d) $4 \times 500 = 2000\text{ m} = 2\text{ km}$, $P = 500$, $Q = 2000$, $R = 2$

Exercise 11B

Perimeter of rectangle = $2(L + b)$, Perimeter of square = $4 \times \text{side}$

1. (a) $P = 2(10 + 2) = 2 \times 12\text{ cm} = 24\text{ cm}$ (b) $P = 4 \times \text{side} = 4 \times 6\text{ cm} = 24\text{ cm}$
2. (a) $P = 2(3\text{ cm} + 2\text{ cm}) = 2 \times 5\text{ cm} = 10\text{ cm}$ (b) $P = 2(12\text{ m} + 10\text{ m}) = 2 \times 22\text{ m} = 44\text{ m}$
 (c) $P = 2(5\text{ cm} + 4\text{ cm}) = 2 \times 9\text{ cm} = 18\text{ cm}$
3. (a) $P = 4 \times 2\text{ cm} = 8\text{ cm}$ (b) $P = 4 \times 5\text{ cm} = 20\text{ cm}$
 (c) $P = 4 \times 15\text{ cm} = 60\text{ cm}$ (d) $P = 4 \times 25\text{ cm} = 100\text{ cm}$
4. (a) $b = \frac{P}{2} - l = \frac{80}{2}\text{ cm} - 28\text{ cm} = 40\text{ cm} - 28\text{ cm} = 12\text{ cm}$
 (b) $l = \frac{P}{2} - b = \frac{230}{2}\text{ cm} - 50\text{ cm} = 115\text{ cm} - 50\text{ cm} = 65\text{ cm}$
 (c) $b = \frac{P}{2} - l = \frac{268}{2}\text{ cm} - 84\text{ cm} = 134\text{ cm} - 84\text{ cm} = 50\text{ cm}$
 (d) $l = \frac{P}{2} - b = \frac{360}{2}\text{ cm} - 80\text{ cm} = 180\text{ cm} - 80\text{ cm} = 100\text{ cm}$
 (e) $P = 2(76\text{ cm} + 47\text{ cm}) = 2 \times 123\text{ cm} = 246\text{ cm}$

5. (a) Side = $\frac{P}{4} = \frac{36}{4} \text{ cm} = 9 \text{ cm}$

(b) Side = $\frac{92}{4} = 23 \text{ cm}$

(c) Side = $\frac{128}{4} \text{ cm} = 32 \text{ cm}$

(d) Side = $\frac{512}{4} \text{ cm} = 128 \text{ cm}$

6. (b) Perimeter of diagonal (i) = $2(2 \text{ cm} + 10 \text{ cm}) = 2 \times 12 \text{ cm} = 24 \text{ cm}$.

Perimeter of diagonal (ii) = $2(4 + 5) \text{ cm} = 2 \times 9 \text{ cm} = 18 \text{ cm}$,

Difference = $24 \text{ cm} - 18 \text{ cm} = 6 \text{ cm}$

Exercise 11C

- (a) yes (b) No (c) No (d) Yes (e) No (f) Yes (g) Yes
- (a) $A = 5 \text{ cm}^2$ (b) $A = 9 \text{ cm}^2$ (c) $A = 13 \text{ cm}^2$ (d) $A = 7 \text{ cm}^2$ (e) $A = 9 \text{ cm}^2$
- (a) $A = 18$ square units

Exercise 11D

Area of rectangle = $l \times b$, Area of square = Side $\times$ Side

1. (a) $A = l \times b = 5 \text{ cm} \times 2 \text{ cm} = 10 \text{ cm}^2$

(b) $A = 8 \text{ cm} \times 4 \text{ cm} = 32 \text{ cm}^2$

(c) $A = 3 \text{ cm} \times 3 \text{ cm} = 9 \text{ cm}^2$

(d) $A = 6 \text{ cm} \times 6 \text{ cm} = 36 \text{ cm}^2$

2. (a) $A = 35 \text{ cm} \times 20 \text{ cm} = 700 \text{ cm}^2$

(b) $A = 60 \text{ cm} \times 35 \text{ cm} = 2100 \text{ cm}^2$

(c) $A = 15 \text{ cm} \times 10 \text{ cm} = 150 \text{ cm}^2$

3. (a) $A = 7 \text{ cm} \times 7 \text{ cm} = 49 \text{ cm}^2$

(b) $A = 9 \text{ cm} \times 9 \text{ cm} = 81 \text{ cm}^2$

(c) $A = 18 \text{ cm} \times 18 \text{ cm} = 324 \text{ cm}^2$

4. (a) $l = \frac{A}{b} = \frac{56 \text{ cm}^2}{8 \text{ cm}} = 7 \text{ cm}$

(b) $b = \frac{A}{l} = \frac{216 \text{ cm}^2}{36 \text{ cm}} = 6 \text{ cm}$

(c) $b = \frac{A}{l} = \frac{340 \text{ cm}^2}{17 \text{ cm}} = 20 \text{ cm}$

(d) $l = \frac{A}{b} = \frac{900 \text{ cm}^2}{45 \text{ cm}} = 20 \text{ cm}$

5. (d) Area of square = $20 \text{ cm} \times 20 \text{ cm} = 400 \text{ cm}^2$ = Area of rectangle, $b = \frac{A}{l} = \frac{400 \text{ cm}^2}{25 \text{ cm}} = 16 \text{ cm}$

Challenge!

1. Perimeter of Box A = $2(5 + 4) \text{ cm} = 2 \times 9 \text{ cm} = 18 \text{ cm}$

Perimeter of Box B = $2(6 + 2) \text{ cm} = 2 \times 8 \text{ cm} = 16 \text{ cm}$

Leena can use Box A.

2. Area of Manas's room = $6 \text{ m} \times 3 \text{ m} = 18 \text{ m}^2$

Area of Ritu's room = $3 \text{ m} \times 6 \text{ m} = 18 \text{ m}^2$

Both have same sized rooms of area 18 m^2 .

Mental Maths

- The total length of a closed figure is called its Perimeter.
- Perimeter of a square is 4 times the length of its side.
- Perimeter of a triangle whose sides are 14 cm, 15 cm and 18 cm is 47 cm.



4. The area is the measure of the flat surface enclosing a figure.
5. The area of rectangle is 30 m^2 . Length is 10 cm . Its breadth $= \frac{30 \text{ cm}^2}{10 \text{ cm}} = 3 \text{ cm}$

Chapter Test

1. $P = 30 \text{ cm}$
2. $l = 80 \text{ cm}, b = \frac{3}{4} \times 80 \text{ cm} = 60 \text{ cm}$
 $P = 2(l + b) = 2(80 \text{ cm} + 60 \text{ cm}) = 2 \times 140 \text{ cm} = 280 \text{ cm}.$
3. $A = 10 \text{ m} \times 12 \text{ m} = 120 \text{ m}^2$
4. Side of square $= \frac{52 \text{ cm}}{4} = 13 \text{ cm}$, Area of square $= 13 \text{ cm} \times 13 \text{ cm} = 169 \text{ cm}^2.$
5. Area of 1 square $= 7 \text{ cm} \times 7 \text{ cm} = 49 \text{ cm}^2.$
 $\therefore$ Area of 12 squares $= 49 \text{ cm}^2 \times 12 = 588 \text{ cm}^2.$
6. (c)
7. (b) $\{P = 2(11 + 2) \text{ cm} = 2 \times 13 \text{ cm} = 26 \text{ cm}, A = 11 \times 2 = 22 \text{ cm}^2\}$
8. (c) $\{A = 24 \text{ m} \times 12 \text{ m} = 288 \text{ m}^2\}$
9. (d) $\{\text{Area of square} = 18 \text{ cm} \times 18 \text{ cm} = 324 \text{ cm}^2, l = \frac{324 \text{ cm}^2}{6 \text{ cm}} = 54 \text{ cm}\}$

Challenge!

$$P = 7 \text{ cm} + 2 \text{ cm} + 4 \text{ cm} + 4 \text{ cm} + 6 \text{ cm} + 6 \text{ cm} + 6 \text{ cm} + 6 \text{ cm} + 4 \text{ cm} + 4 \text{ cm} + 5 \text{ cm} + 2 \text{ cm} = 56 \text{ cm}$$

$$A = (6 \times 6) \text{ cm}^2 + (4 \times 8) \text{ cm}^2 + (2 \times 7) \text{ cm}^2 = 36 \text{ cm}^2 + 32 \text{ cm}^2 + 14 \text{ cm}^2 = 82 \text{ cm}^2$$