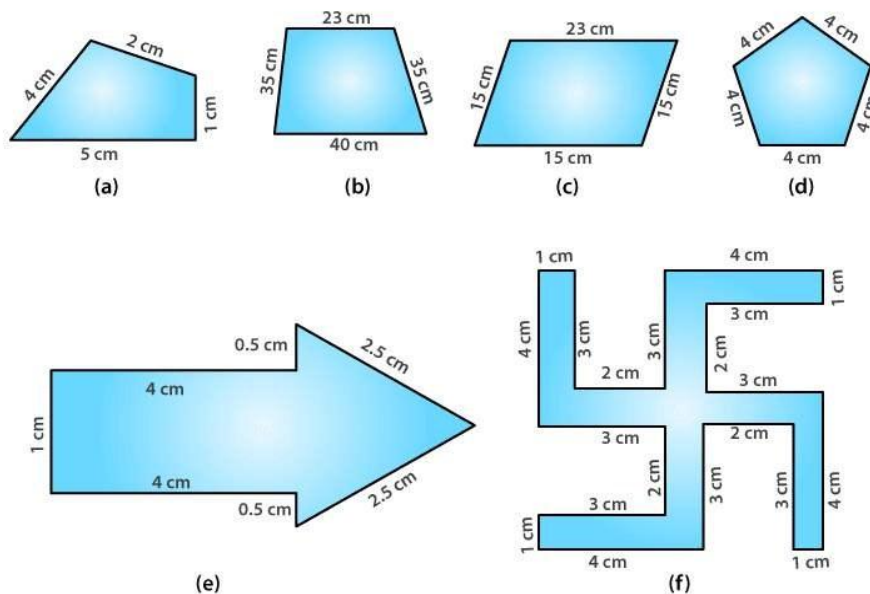## EXERCISE 10.1 PAGE NO: 212

1. Find the perimeter of each of the following figures:

Solutions:

(a) Perimeter = Sum of all the sides
= 1 + 2 + 4 + 5
= 12 cm

(b) Perimeter = Sum of all the sides
= 23 + 35 + 35 + 40
= 133 cm

(c) Perimeter = Sum of all the sides
= 15 + 15 + 15 + 15
= 60 cm

(d) Perimeter = Sum of all the sides
= 4 + 4 + 4 + 4 + 4
= 20 cm

(e) Perimeter = Sum of all the sides
= 1 + 4 + 0.5 + 2.5 + 2.5 + 0.5 + 4
= 15 cm

(f) Perimeter = Sum of all the sides
= 4 + 1 + 3 + 2 + 3 + 4 + 1 + 3 + 2 + 3 + 4 + 1 + 3 + 2 + 3 + 4 + 1 + 3 + 2 + 3
= 52 cm

2. The lid of a rectangular box of sides 40 cm by 10 cm is sealed all around with tape. What is the length of the tape required?

Solutions:

Length of required tape = Perimeter of rectangle

= 2 (Length + Breadth)

= 2 (40 + 10)

= 2 (50)

= 100 cm

∴ Required length of tape is 100 cm

3. A table top measures 2 m 25 cm by 1 m 50 cm. What is the perimeter of the table top?

Solutions:

Length of table top = 2 m 25 cm = 2.25 m

Breadth of table top = 1 m 50 cm = 1.50 m

Perimeter of table top = 2 (Length + Breadth)

= 2 (2.25 + 1.50)

= 2 (3.75)

= 2 × 3.75

= 7.5 m

∴ The perimeter of the table top is 7.5 m

4. What is the length of the wooden strip required to frame a photograph of length and breadth 32 cm and 21 cm respectively?

Solutions:

Required length of wooden strip = Perimeter of photograph

= 2 (Length + Breadth)

= 2 (32 + 21)

= 2 (53)

= 2 × 53

= 106 cm

∴ Required length of the wooden strip is 106 cm

5. A rectangular piece of land measures 0.7 km by 0.5 km. Each side is to be fenced with 4 rows of wires. What is the length of the wire needed?

Solutions:

Perimeter of the field = 2 (Length + Breadth)

= 2 (0.7 + 0.5)

= 2 (1.2)

= 2 × 1.2

= 2.4 km

Each side is to be fenced with 4 rows = 4 × 2.4

= 9.6 km

∴ Total length of the required wire is 9.6 km

6. Find the perimeter of each of the following shapes:
(a) A triangle of sides 3 cm, 4 cm and 5 cm
(b) An equilateral triangle of side 9 cm
(c) An isosceles triangle with equal sides 8 cm each and third side 6 cm.
Solutions:
(a) Perimeter of triangle = 3 + 4 + 5
　　　 = 12 cm
(b) Perimeter of an equilateral triangle = 3 × side
　　　 = 3 × 9
　　　 = 27 cm
(c) Perimeter of isosceles triangle = 8 + 8 + 6
　　　 = 22 cm

7.　Find the perimeter of a triangle with sides measuring 10 cm, 14 cm and 15 cm.
Solutions:
Perimeter of triangle = 10 + 14 + 15
　　　 = 39 cm
∴ The perimeter of triangle is 39 cm

8.　Find the perimeter of a regular hexagon with each side measuring 8 m.
Solutions:
Perimeter of hexagon = 6 × 8
　　　 = 48 m
∴ Perimeter of regular hexagon is 48 m

9.　Find the side of the square whose perimeter is 20 m.
Solutions:
Perimeter of square = 4 × side
　　　 20 = 4 × side
　　　 Side = 20 / 4
　　　 Side = 5 m
∴ The side of the square is 5 m

10. The perimeter of a regular pentagon is 100 cm. How long is its each side?
Solutions:
Perimeter of regular pentagon = 100 cm
　　　 5 × side = 100 cm
　　　 Side = 100 / 5
　　　 Side = 20 cm
∴ Side of the pentagon is 20 cm

11. A piece of strings is 30 cm long. What will be the length of each side if the string is used to form:

(a) a square?

(b) an equilateral triangle?

(c) a regular hexagon?

Solutions:

Perimeter of square = 30 cm

$\quad$ 4 × side = 30

$\quad$ Side = 30 / 4

$\quad$ Side = 7.5 cm

Perimeter of an equilateral triangle = 30 cm

$\quad$ 3 × side = 30

$\quad$ Side = 30 / 3

$\quad$ Side = 10 cm

Perimeter of a regular hexagon = 30 cm

$\quad$ 6 × side = 30

$\quad$ Side = 30 / 6

$\quad$ Side = 5 cm

12. Two sides of a triangle are 12 cm and 14 cm. The perimeter of the triangle is 36 cm. What is its third side?

Solutions:

$\quad$ Let x cm be the third side

$\quad$ Perimeter of triangle = 36 cm

$\quad$ 12 + 14 + x = 36

$\quad$ 26 + x = 36

$\quad$ x = 36 - 26

$\quad$ x = 10 cm

∴ The third side is 10 cm

13. Find the cost of fencing a square park of side 250 m at the rate of ▢ 20 per metre.

Solutions:

$\quad$ Side of square = 250 m

$\quad$ Perimeter of square = 4 × side

$\quad$ = 4 × 250

$\quad$ = 1000 m

$\quad$ Cost of fencing = ▢ 20 per m

$\quad$ Cost of fencing for 1000 m = ▢ 20 × 1000

$\quad$ = ▢ 20,000

14. Find the cost of fencing a rectangular park of length 175 cm and breadth 125 m at the rate of ▢ 12 per metre.

Solutions:

    Length = 175 cm

    Breadth = 125 m

    Perimeter of rectangular park = 2 (Length + Breadth)

    = 2 (175 + 125)

    = 2 (300)

    = 2 × 300

    = 600 m

    Cost of fencing = 12 × 600

    = 7200

∴ Cost of fencing is ☐ 7,200

15. Sweety runs around a square park of side 75 m. Bulbul runs around a rectangular park with length 60 m and breadth 45 m. Who covers less distance?

Solutions:

    Perimeter of square = 4 × side

    = 4 × 75

    = 300 m

∴ Distance covered by Sweety is 300 m

    Perimeter of rectangular park = 2 (Length + Breadth)

    = 2 (60 + 45)

    = 2 (105)

    = 2 × 105

    = 210 m

∴ Distance covered by Bulbul is 210 m

Hence, Bulbul covers less distance than Sweety.
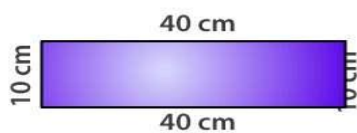
16. What is the perimeter of each of the each of the following figures? What do you infer from the the answers?
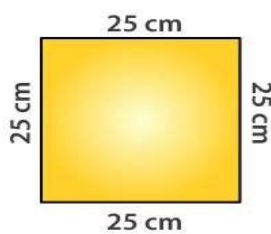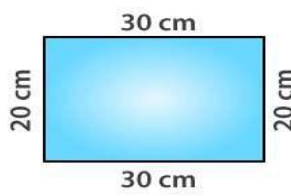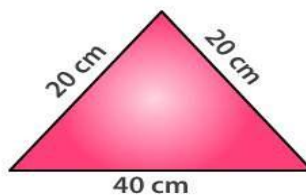
Solutions:

(a) Perimeter of square = 4 × side

= 4 × 25

= 100 cm

(b) Perimeter of rectangle = 2 (40 + 10)

= 2 × 50

= 100 cm

(c) Perimeter of rectangle = 2 (Length + Breadth)

= 2 (30 + 20)

= 2 (50)

= 2 × 50

= 100 cm

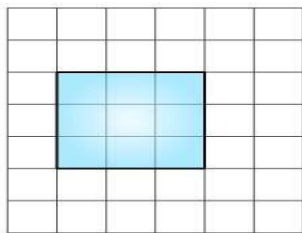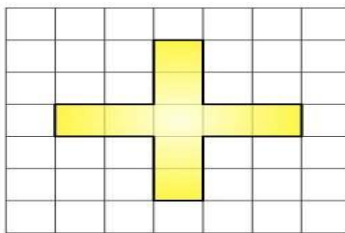**(d)** Perimeter of triangle = 30 + 30 + 40

= 100 cm

All the figures have same perimeter.

17. Avneet buys 9 square paving slabs, each with a side of 1 / 2 m. He lays them in the form of a square.

(a) What is the perimeter of his arrangement [fig 10.7(i)]?

(i)   (ii)

(b) Shari does not like his arrangement. She gets him to lay them out like a cross. What is the perimeter of her arrangement [(Fig 10.7 (ii)]?

(c) Which has greater perimeter?

(d) Avneet wonders if there is a way of getting an even greater perimeter. Can you find a way of doing this? (The paving slabs must meet along complete edges i.e they cannot be broken.)

Solutions:

(a) Side of square = 3 × side

= 3 × 1 / 2

= 3 / 2 m

Perimeter of Square = 4 × 3 / 2

= 2 × 3

= 6 m

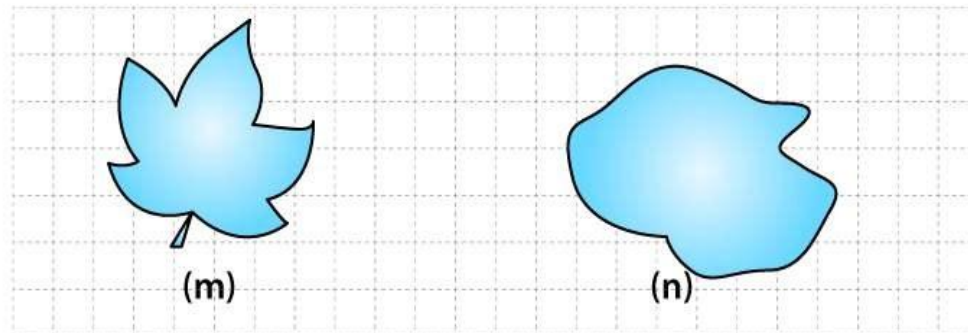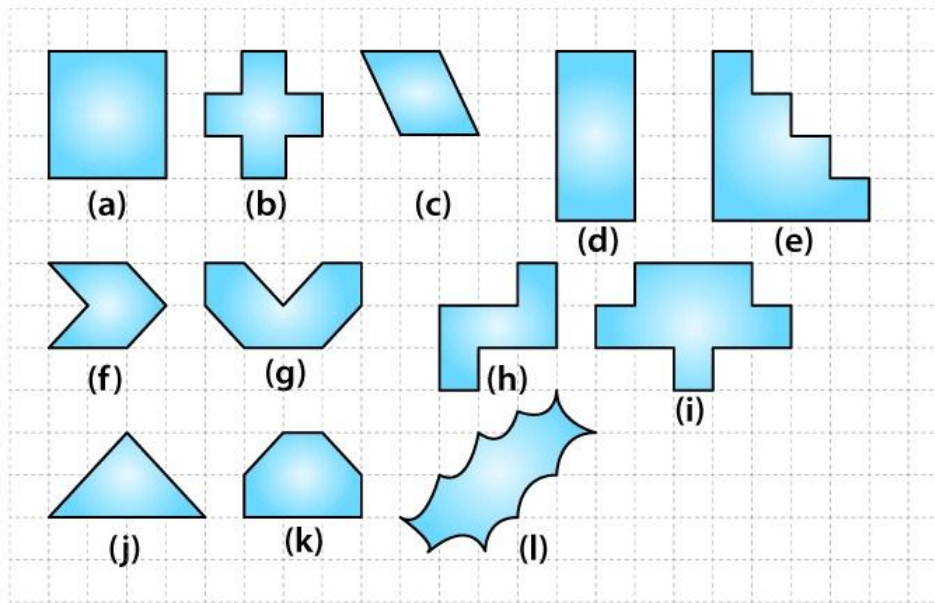**(b)** Perimeter = 0.5 + 1 + 1 + 0.5 + 1 + 1 + 0.5 + 1 + 1 + 0.5 + 1 + 1

= 10 m

(c) The arrangement in the form of cross has greater perimeter (d) Perimeters greater than 10 m cannot be determined.

EXERCISE 10.2   **PAGE NO: 216**

1. Find the areas of the following figures by counting square:

(a) The figure contains only 9 fully filled squares. Hence, the area of this figure will be 9 square units.
(b) The figure contains only 5 fully filled squares. Hence, the area of this figure will be 5 square units.
    (c) The figure contains 2 fully filled squares and 4 half filled squares. Hence, the area of this figure
    will be 4 square units.
(d) The figure contains only 8 fully filled squares. Hence, the area of this figure will be 8 square units.
(e) The figure contains only 10 fully filled squares. Hence, the area of this figure will be 10 square units.
(f) The figure contains only 2 fully filled squares and 4 half filled squares. Hence, the area of this figure
    will be 4 square units.
(g) The figure contains 4 fully filled squares and 4 4 half filled squares. Hence, the area of this figure
    will be 6 square units.
(h) The figure contains 5 fully filled squares. Hence, the area of this figure will be 5 square units.
(i) The figure contains 9 fully filled squares. Hence, the area of this figure will be 9 square units.
(j) The figure contains 2 fully filled squares and 4 half filled squares. Hence, the area of this figure will
    be 4 square units.

(k) The figure contains 4 fully filled squares and 2 half filled squares. Hence, the area of this figure will be 5 square units.

(l) From the given figure, we observe

Covered Area	Number	Area estimate (square units)
Fully filled squares	2	2
Half filled squares	-	-
More than half filled squares	6	6
Less than half filled squares	6	0

Therefore total area = 2 + 6

$\qquad$ = 8 square units.

(m) From the given figure, we observe

Covered Area	Number	Area estimate (square units)
Fully filled squares	5	5
Half filled squares	-	-
More than half filled squares	9	9
Less than half filled squares	12	0

Therefore total area = 5 + 9

$\qquad$ = 14 square units

(n) From the given figure, we observe

Covered Area	Number	Area estimate (square units)
Fully filled squares	8	8
Half filled squares	-	-
More than half filled squares	10	10
Less than half filled squares	9	0

Therefore total area = 8 + 10 = 18 square units

EXERCISE 10.3   PAGE NO: 219

1. Find the area of the rectangles whose sides are:
(a) 3 cm and 4 cm
(b) 12 m and 21 m
(c) 2 km and 3 km
(d) 2 m and 70 cm

Solutions:
We know that
          Area of rectangle = Length × Breadth
(a) l = 3 cm and b = 4 cm
          Area = l × b = 3 × 4
          = 12 cm^2
(b) l = 12 m and b = 21 m
          Area = l × b = 12 × 21
          = 252 m^2
(c) l = 2 km and b = 3 km
          Area = l × b = 2 × 3
          = 6 km^2
(d) l = 2 m and b = 70 cm = 0.70 m
          Area = l × b = 2 × 0.70
          = 1.40 m^2

2. Find the areas of the squares whose sides are:
(a) 10 cm
(b) 14 cm (c) 5 m
Solutions:
(a) Area of square = side^2
          = 10^2
          = 100 cm^2
(b) Area of square = side^2
          = 14^2
          = 196 cm^2
(c) Area of square = side^2
          = 5^2
          =25 cm^2

3. The length and breadth of three rectangles are as given below:
(a) 9 m and 6 m
(b) 17 m and 3 m
(c) 4 m and 14 m
Which one has the largest area and which one has the smallest?

Solutions:
(a) Area of rectangle = l × b
    = 9 × 6
    = 54 m²
(b) Area of rectangle = l × b
    = 17 × 3
    = 51 m²
(c) Area of rectangle = l × b
    = 4 × 14
    = 56 m²
Area of rectangle 56 m² i.e (c) is the largest area and area of rectangle 51 m² i.e (b) is the smallest area

4. The area of a rectangular garden 50 m long is 300 sq m. Find the width of the garden.
Solutions:
Area of rectangle = length × width
    300 = 50 × width
width = 300 / 50
    width = 6 m
∴ The width of the garden is 6 m

5. What is the cost of tiling a rectangular plot of land 500 m long and 200 m wide at the rate of ▢ 8 per hundred sq m.?
Solutions:
Area of land = length × breadth
    = 500 × 200
    = 1,00,000 m²
        1,00,000 sq m of land = (8 × 1,00,000) / 100
∴ Cost of tiling
    = ▢ 8000

6. A table top measures 2 m by 1 m 50 cm. What is its area in square metres? Solutions: Given
    l = 2m
    b = 1m 50 cm = 1.50 m
Area = l × b = 2 × 1.50
    = 3 m²

7. A room is 4 m long and 3 m 50 cm wide. Howe many square metres of carpet is needed to cover the floor of the room?
Solutions: Given
    l = 4m
    b = 3 m 50 cm = 3.50 m
Area = l × b = 4 × 3.50
    =14 m²

8. A floor is 5 m long and 4 m wide. A square carpet of sides 3 m is laid on the floor. Find the area of the floor that is not carpeted.

Solutions:

Area of floor $= l \times b = 5 \times 4$

$= 20 \text{ m}^2$

Area of square carpet $= 3 \times 3$

$= 9 \text{ m}^2$

Area of floor that is not carpeted $= 20 - 9$

$= 11 \text{ m}^2$

∴ Area of the floor that is not carpeted is 11 m^2

9. Five square flower beds each of sides 1 m are dug on a piece of land 5 m long and 4 m wide. What is the area of the remaining part of the land?

Solutions:

Area of flower square bed $= 1 \times 1$

$= 1 \text{ m}^2$

Area of 5 square bed $= 1 \times 5$

$= 5 \text{ m}^2$

Area of land $= 5 \times 4$

$= 20 \text{ m}^2$

Remaining part of the land $=$ Area of land $-$ Area of 5 square bed

$= 20 - 5$

$= 15 \text{ m}^2$

∴ Remaining part of the land is 15 m^2

10. By splitting the following figures into rectangles, find their areas (The measures are given in centimetres).

(a)   (b)

Solutions:

(a)
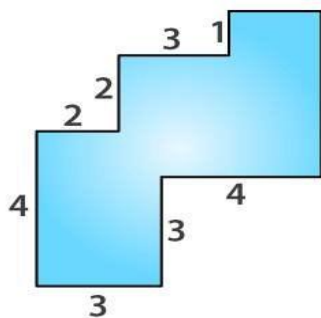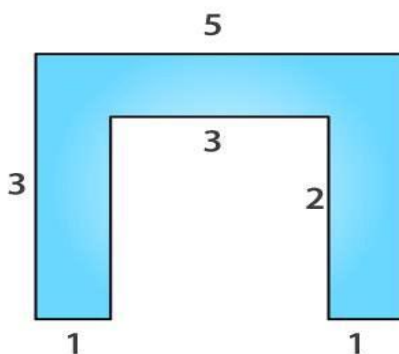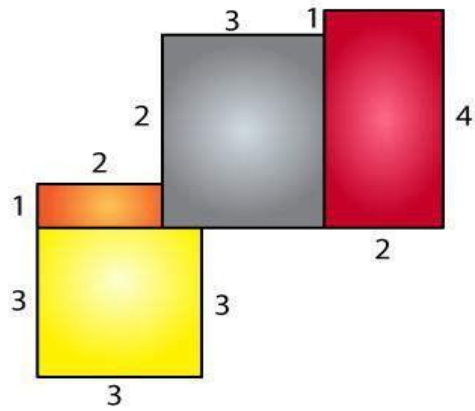
Area of yellow region = 3 × 3
= 9 cm^2
Area of orange region = 1 × 2
= 2 cm^2
Area of grey region = 3 × 3
= 9 cm^2
Area of brown region = 2 × 4
= 8 cm^2
Total area = 9 + 2 + 9 + 8
= 28 cm^2

∴ Total area is 28 cm^2

(b)
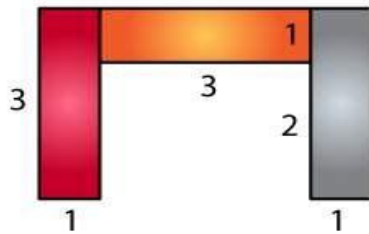
Area of brown region = 3 × 1
= 3 cm^2
Area of orange region = 3 × 1
= 3 cm^2
Area of grey region = 3 × 1
= 3 cm^2
Total area = 3 + 3 + 3
= 9 cm^2

∴Total area is 9 cm^2

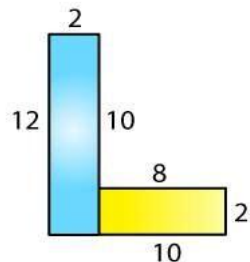**11. Split the following shapes into rectangles and find their areas. (The measures are given in centimetres)**

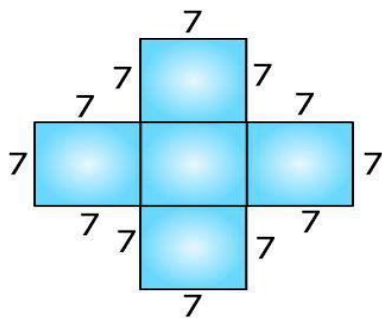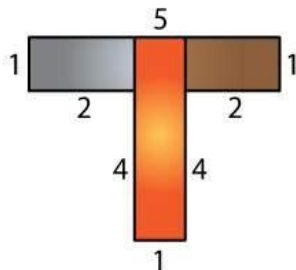(a)   (b)   (c)

Solutions:

(a)
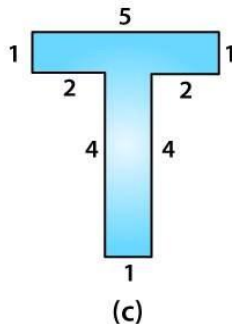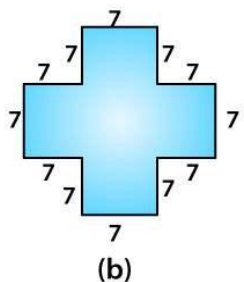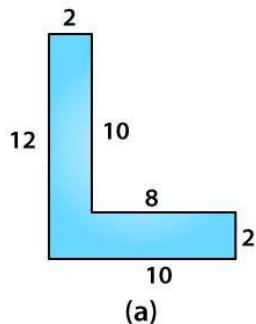
Total area of the figure $= 12 \times 2 + 8 \times 2$
$= 40$ cm^2

(b)

There are 5 squares. Each side is 7 cm
Area of 5 squares $= 5 \times 7^2$
$= 245$ cm^2

(c)

Area of grey rectangle = 2×1

= 2 cm^2

Area of brown rectangle = 2×1

= 2 cm^2

Area of orange rectangle = 5×1

= 5 cm^2

Total area = 2 + 2 + 5

= 9 cm^2

12. How many tiles whose length and breadth are 12 cm and 5 cm respectively will be needed to fit in a rectangular region whose length and breadth are respectively?

(a) 100 cm and 144 cm

(b) 70 cm and 36 cm

Solutions:

(a) Area of rectangle = 100×144

= 14400 cm

Area of one tile = 5×12

= 60 cm^2

Number of tiles = (Area of rectangle) / (Area of one tile)

= 14400 / 60

= 240

Hence, 240 tiles are needed

(b) Area of rectangle = 70×36

= 2520 cm^2

Area of one tile = 5×12

= 60 cm^2

Number of tiles = (Area of rectangle) / (Area of one tile)

= 2520 / 60

= 42

Hence, 42 tiles are needed