DEPARTMENT OF EDUCATION (S)
Government of Manipur

Class- V
Subject: MATHS
Chapter-3: HOW MANY SQUARES?

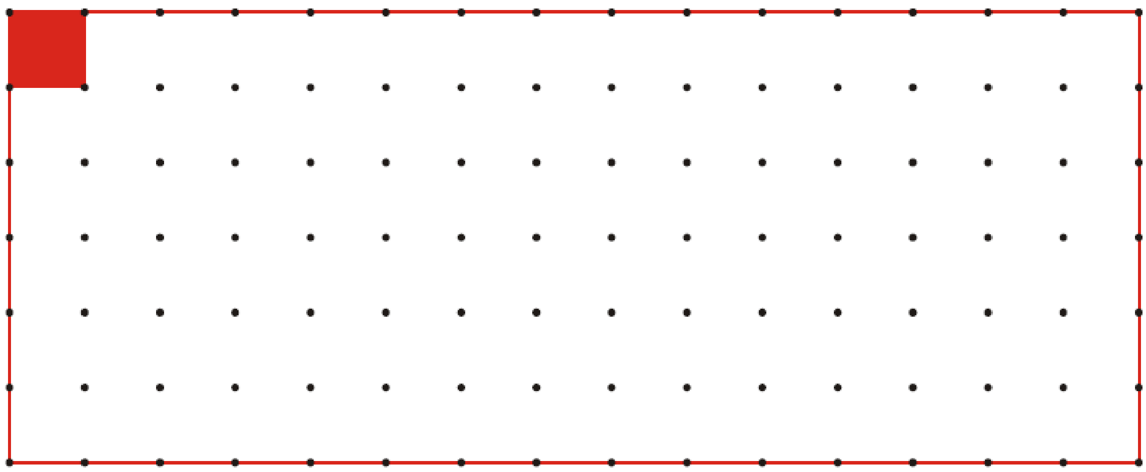
TEXTUAL QUESTIONS AND ANSWER

Area: The area is the amount of two-dimensional space taken up by the object. It is measured in square units.

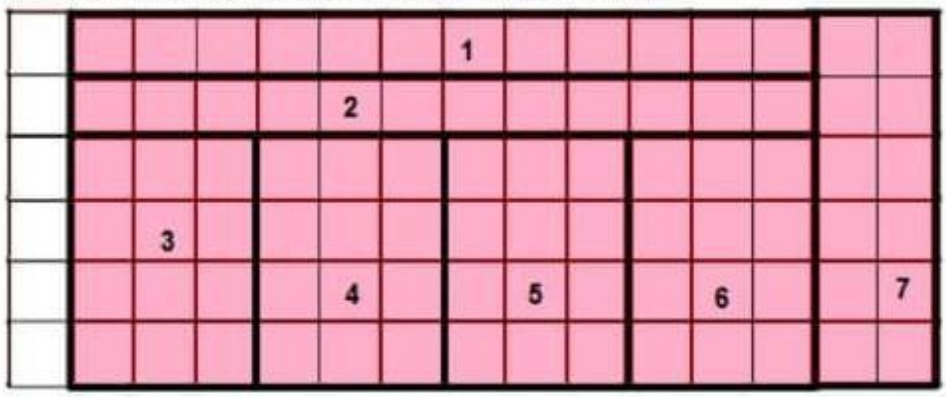
Perimeter: A perimeter refers to the total boundary of the two-dimensional shape.

Square: A square is a two-dimensional plane figure whose interior angles and side lengths are all equal.

Rectangle: A rectangle is a two-dimensional plane figure in which the opposite sides are parallel and equal to each other.



The side of the square on dotted sheet is 1 cm.



Q1. How many rectangles could you make? (see the above figures)

Ans: We can make 7 rectangles by using 12 squares.

2 rectangles are of size 1 x 12 centimeters

1 rectangle is of size 2 x 6 centimeters

4 rectangles are of size 3 x4

centimeters. Thus, number of

rectangles = 2 + 1 + 4 = 7

Q2. Each rectangle is made out of 12 equal squares, so all have the same area, but the length of the boundary will be different.

(i) Which of these rectangles has the longest perimeter?

Ans: From the above figure, we can say that rectangle 1and rectangle 2 has the longest perimeter.

Perimeter of rectangle measuring 1 x 12 cm = 2(length x breadth)

=2(1 +12)

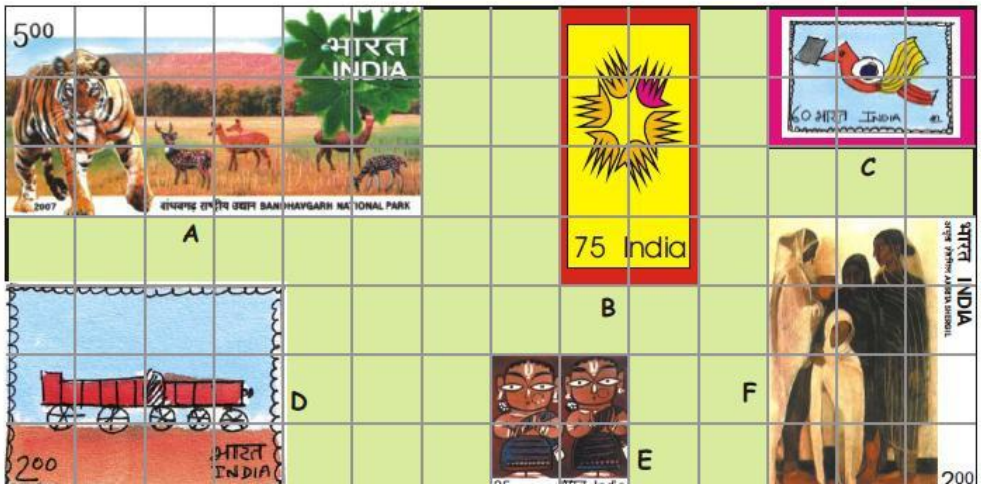
= 2 x13

= 26 cm

(ii) Which of these rectangles has the smallest perimeter?

Ans: The rectangle measuring 3 x 4 has the smallest

perimeter.



Q.3. Look at these interesting stamps.

(a) How many squares of one-centimeter side does stamp A cover?

Ans: Stamp A covers 18 squares of one-centimeter side since area = 6 x 3 = 18 square cm.

(b) And stamp B?
Ans: Stamp B covers 8 squares of one-centimeter side since area = 4 x 2 = 8 square cm.

Q3b(i) Which stamp has the biggest area?
Ans: Stamp A has the biggest area because it has 18 squares.

Q3b(ii) How many squares of side 1 cm does stamp cover?
Ans: This stamp covers 18 squares of side 1 cm.

Q3b(iii) How much is the area of the biggest stamp?
Ans: 18 square cm is the area of the biggest stamp.

Q3b(iv) Which two stamps have the same area?
Ans: Stamp D and F have the same area.

Q3b(v) How much is the area of each of these stamps?
Ans: The area of stamp D and F each is 12 square cm.

Q3b(vi)The area of the smallest stamp is---------- square cm.
Ans: 4 square cm.

Q3b(vii) The difference between the area of the smallest and the biggest stamp is .....square cm.
Ans: Area of the biggest stamp – area of the smallest stamp
=18- 4
= 14 square cm

Q4a Which has the bigger area- one of your footprints or the page of this book?
Ans: The area of page of this book is bigger than footprints.

Q4b Which has the smaller area? two five- rupee notes together or a hundred- rupee note!

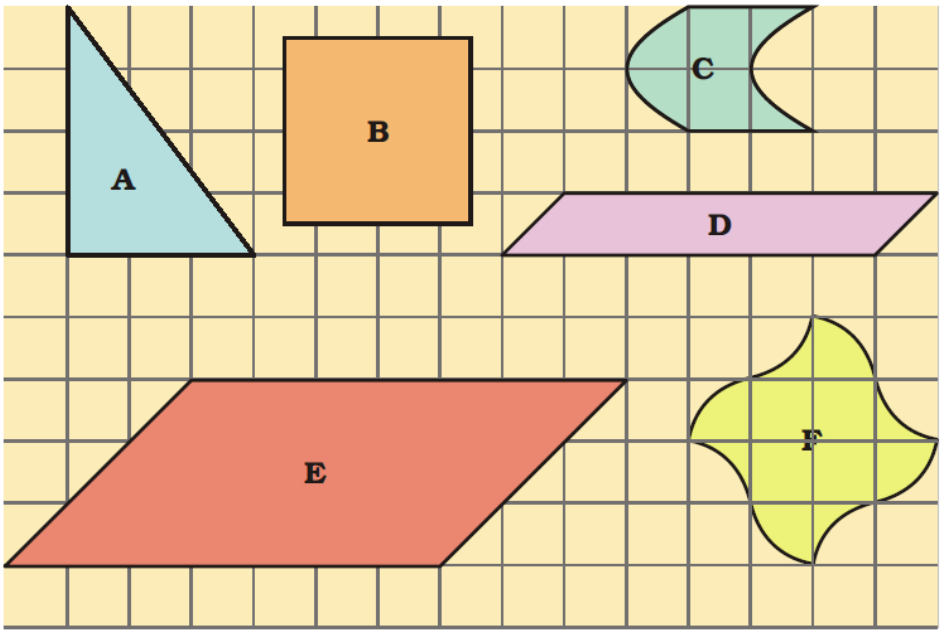
Ans: A hundred- rupee note has the smaller area
.
Q4c Look at a 10 rupee- note. Is its area more than hundred square cm?
Ans: No, the area of 10 rupee –note is not more than hundred square cm.

Q4d Is the area of the blue shape more than the area of the yellow shape. Why?

Ans: No, the area of blue shape is equal to the area of yellow shape. Because the blue and yellow shaped figures are divided into two triangles of equal areas.

Q4e **Is the perimeter of the yellow shape more than the perimeter of the blue shape? Why?**
Ans: No, the perimeter of yellow shape is less than the perimeter of the blue shape. This can be proved by measuring their boundary of blue and yellow shape by ruler or by thread.

Q5 **Write the area (in square cm) of the shapes below**.



Solution:

Area of triangle fig A = ½ × base × height

= ½ × 3 × 4

= ½ × 12

= 6 cm^2

Area of square fig B = 4 complete square + 8 half squares + 4 quarter squares

= 4 + (½ × 8) + (¼ × 4)

= 4 + 4 + 1

= 9 cm^2

Area of fig C = 2 complete square + 4 half squares

= 2 + (½ × 4)

= 2 + 2

= 4 cm^2

Area of fig D = 5 complete square + 2 half squares

= 5 + (½ × 2)

= 5+ 1

= 6 cm^2

Area of fig E = 18 complete square + 6 half squares

$= 18 + (½ \times 6)$

$= 18 + 3$

$= 21\ cm^2$

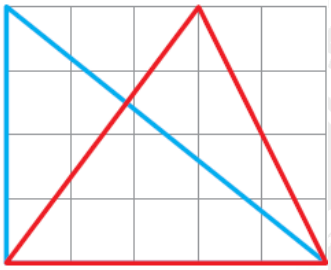
Area of fig F = 4 complete square + 4 more than half + 4 quarter square

$= 4 + (¾ \times 4) + (¼ \times 4)$

$= 4 + 3 + 1$

$= 8\ cm^2$

Q6 The blue triangle is half of the big rectangle. Area of the big rectangle is 20 square cm. So,the area of the blue triangle is _____ square cm.



Solution:

From the question,

Area of the big rectangle is $20cm^2$.

Area of the blue triangle is half of the big rectangle = 20/2

$= 10\ cm^2$

Q7 Ah, in it there are two halves of two different rectangles!

Now you find the area of the two rectangles Sadiq is talking about. What is the area of the red triangle? Explain.

Ans: From the figure, we can say that,

The orange rectangle contains 12 squares

So, area of orange rectangle = $12\ cm^2$

Then, green rectangle contains 8 squares

So, the area of green rectangle = $8\ cm^2$

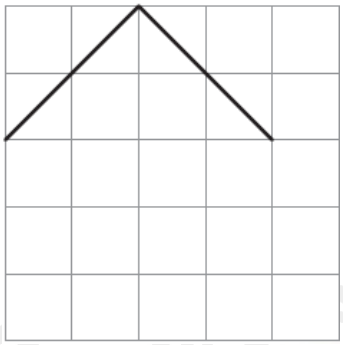
Now, area of the orange portion of triangle = $12/2 = 6cm^2$

Area of the yellow portion of triangle = $8/2 = 4\ cm^2$

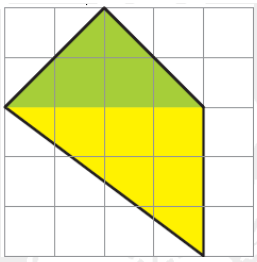
Therefore, area of red triangle = 6 + 4

$= 10\ cm^2$

Q8 Suruchi drew two sides of a shape. She asked Asif to complete the shape with two more sides, so that its area is 10 square cm.



He completed the shape like this



(i) Is He correct? Discuss.

Solution:Yes, he is correct.

(ii) Explain how the green area is 4 square cm and the yellow area is 6 square cm.

Solution: Green area contains = 2 complete square + 4 half squares

$= 2 + (½ \times 4)$

$= 2 + 2$

$= 4\ cm^2$

Yellow area contains = 3 complete square + 2 more than half + 2 half filled

$= 3 + 2 + (½ \times 2)$

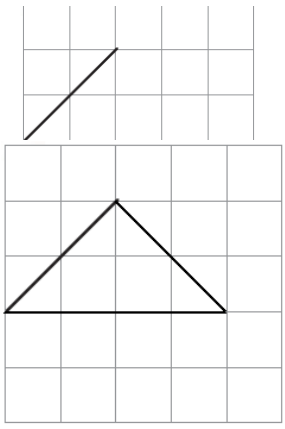
$= 3 + 2 + 1$

$= 6\ cm^2$

Practice time:

(i) This is one of the sides of a shape. Complete the shape so that its area is 4 square cm.

Ans:



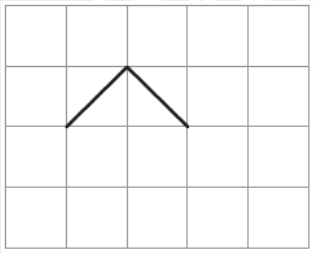
The completed shape contains = 2 complete square + 4 half squares

$= 2 + (½ \times 4)$

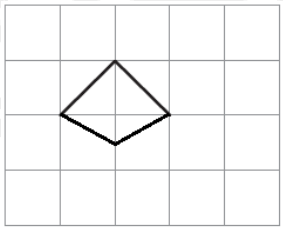
$= 2 + 2$

$= 4\ cm^2$

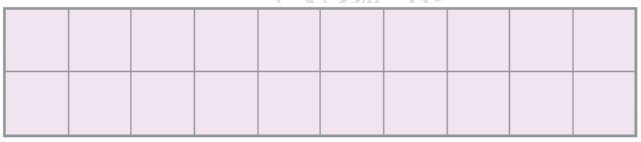
Q9. Two sides of a shape are drawn here. Complete the shape by drawing two more sides so that its area is less than 2 square cm.



Ans:

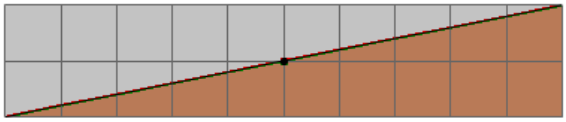


Q10. Here is a rectangle of area 20 square cm.



a) Draw one straight line in this rectangle to divide it into two equal triangles. What is the area of each of the triangles?

Solution:



Area of rectangle = 10 × 2

= 20 cm^2

Then, area of two equal triangles = 20/2

= 10 cm^2

Because, it is given that straight line divides rectangle in to two equal triangles.

b) Draw one straight line in this rectangle to divide it into two equal rectangles. What is the area of each of the smaller rectangles?

Solution:

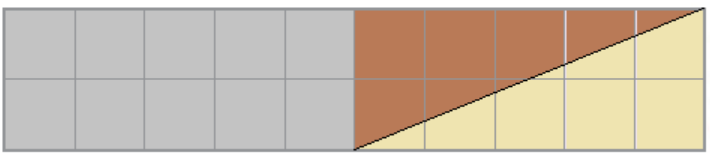
Area of big rectangle = 10 cm^2

The area of each of the smaller rectangle = 20/2

= 10 cm^2

c) Draw two straight lines in this rectangle to divide it into one rectangle and two equal triangles.

Solution:



(i) What is the area of the rectangle?

Solution:

Area of rectangle = length × breadth

= 2 × 5

= 10 cm^2

(ii) What is the area of each of the triangles?

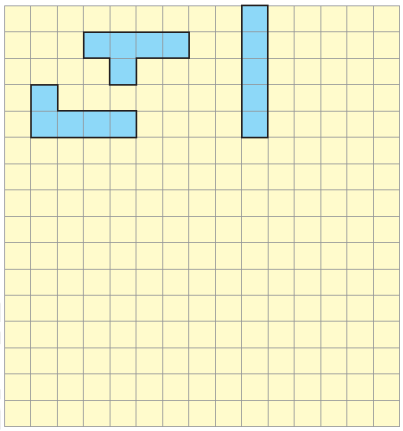
Solution:

Area of each triangle = ½ × area of smaller rectangle

= ½ × 10

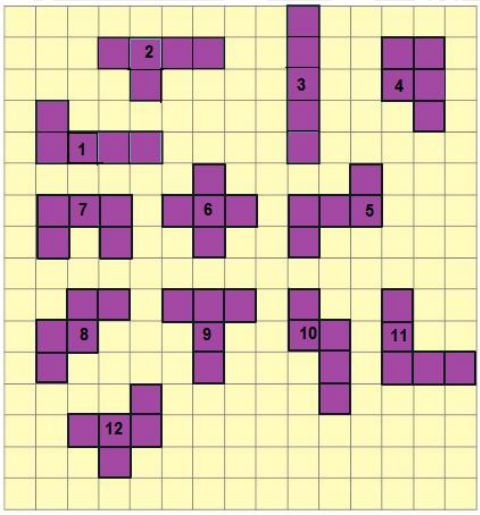
= 5 cm^2

Q11. Puzzle with five squares



a) How many different shapes can you draw?

Solution: Using 5 squares, we can draw 12 shapes as show in the below,



b) Which shape has the longest perimeter? How much?

Solution: Shape 4 has the smallest perimeter out of 12 shapes, rest of the shapes have same perimeter. i.e. = 1 + 1 + 1 + 1 + 1 + 1+ 1 + 1 + 1 + 1 + 1 + 1 = 12 cm

c) Which shape has the shortest perimeter? How much?

Solution: Out of 12 shapes 4 has the smallest perimeter.

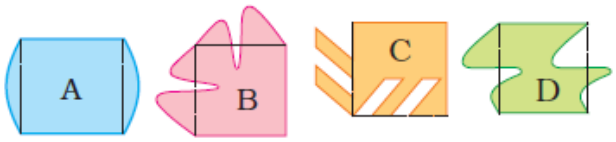
i.e. = 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 10 cm.

d) What is the area of the shapes? _____ square cm. That's simple!

Solution: There are 12 shapes each shapes has complete five squares. Area of 1 square is equal to 1 cm^2.

So, Area of each shape = 1 × 5 = 5 cm^2.

Q12. Ziri tried to make some other tiles. She started with a square of 2 cm side and made shapes like these.



Ans: The shapes C and D will tile a floor (without any gaps).
The area of each of these shapes (i.e. tiles) is 2 x 2 square cm = 4 square cm.

Q13. Make a pattern using your tile. Trace the shape to repeat it on a page, but remember there must be no gaps between them. Ziri made a pattern using her yellow tiles. (You know the area of her tile.)

Q14. How many tiles has she used?

Ans. She has used 12 tiles.

Q15. What is the area of the floor pattern Ziri has made here?

Ans. The area of the floor pattern Ziri has made here is (12 x 3) square cm= 36 square cm.