NOTES

CLASS 6
MATHS

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MENSURATION

I. Important Concepts/ Results

Perimeter: The distance covered along the boundary forming a closed figure when you make one complete round of it is called as Perimeter.

Perimeter of rectangle = 2 × (length + breadth)

Perimeter of a Square = 4 × length of side

Perimeter of equilateral triangle = 3 × length of a side

Area: The amount of a surface enclosed by a closed figure is called its area.

Important points for calculating the area by counting squares:

1. The area of one full square is taken as 1 square unit.

2.Ignore portions of the area that are less than half a square.

3.If more than half of a square is in region. Just count it as one square.

4.If exactly half the square is 8 counted, take it's area as ½ square units.

Area of a Rectangle = length × breadth

Area of a square = side × side

Some Examples (with solutions):

II. Some Illustrations/ Examples (with solution)

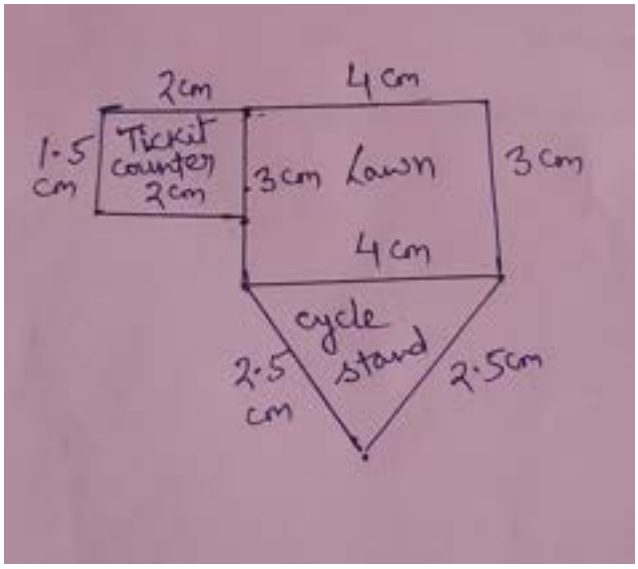
i) MCQs

1. The perimeter of a triangle of sides 3 cm,4cm,5cm is :
(a) 5 cm (b) 9 cm (c) 12 cm (d) 10 cm
Solution: perimeter = sum of all the three sides
= (3+4+5) cm =12 cm
Option (c) 12 cm
2. The side of a square of perimeter 20 cm is
(a) 20 cm (b) 10 cm (c) 5 cm (d) 6 cm
Solution: side of a square = perimeter/4
= 20/4 = 5 cm
Option (c) 5 cm
3. The area of square with side 14 cm is
(a) 14 cm (b) 56 cm (c) 196 cm (d) 196 cm^2
Solution: Area of a square = side × side
= 14 × 14 = 196 cm^2
Option (d) 196 cm^2
4. The perimeter of equilateral triangle with side 7 cm is
(a) 7 cm (b) 14 cm (c) 21 cm (d) 28 cm

Solution: perimeter of equilateral triangle = 3 × length of a side = 3 ×7 = 21 cm.

ii) Case based study

1. Ramkaran went to the amusement park for the picnic.



The dimensions of the park are as shown above:

On the basis of the dimensions of the park answer the following questions:

1. What is the shape of the cycle stand?

2. What is the area of the ticket counter?

3. Find the perimeter of the park?

Solution:

1. Isosceles triangle

2. Area of the ticket counter = 2 ×(l+b) (shape is Rectangle)

= 2× (2 +1.5)
= 2 × 3.5
= 7 cm

3. Perimeter of the park = distance covered in one complete round of the park.
= 2+1.5+2+1.5+2.5+2.5+3+4
= 19 cm

iii) Short answer type questions

1.Seema went to a park 150 m long and 70 m wide. She took one complete round of it. What is the distance covered by her ?

Solution: Distance covered in one complete round = perimeter of the park
= 2 × (l + b)

= 2 ×(150 +70)

= 2×220

=440 cm

2. The area of a rectangular piece of a cardboard is 36 sq. Cm. and its length is 9 cm. What is the width of the cardboard?

Solution: Area of the cardboard = length × breadth

36 = 9 × width

Width = 36 /9

Width = 4 cm.

3. Find the area of the adjoining figure:



Solution: Area of the figure = (4 + 0.5 + 0.5 + 0.5 +0.5)

= 4+2

= 6 sq. cm.

iv) Long answer type questions

1.Salim wants to cover a room 3 m wide and 4 m long by soured tiles. If each square tile is of side 0.5 m, then find the number of tiles required to cover the floor of the room.

Solution: Number of tiles = area of the room / area of one tiles

Area of the room = length × breadth

= 3 × 4

= 12 sq. M

Area of one tiles = side × side

= 0.5 × 0.5

= 0.25

Number of tiles = 12 / 0.25

= 12 × 100 / 25

= 48

2.Pinky runs around a square field of side 75 m. Bob runs around a rectangular field with length 160 m and breadth 120 m. Who covers more distance and by how much?

Solution: Distance covered by Pinky = perimeter of the square field

= 4 × length of a side

= 4 × 75 = 300 m

Distance covered by Bob = perimeter of rectangular field

= 2 × (length + breadth)

= 2 × (160 + 120) = 2 × 280 = 560 m

Hence Bob covered more distance by (560 – 300)260 m

III. Questions for Practice

i) MCQs

1. The perimeter of equilateral triangle of side 2a cm is

(a) 6 cm (b) 6a cm (c) 8a cm (d) 10 cm

2. The perimeter of regular Pentagon of side 5 cm is

(a) 20 cm (b) 30 cm (c) 25 cm (d) 35 cm

3. The perimeter of a rectangular plot of length 2.5 cm and breadth 1.5 cm is

(a) 20 cm (b) 24 cm (c) 36 cm (d) 8 cm

4. The perimeter of regular hexagon is 42 cm , find the length of each side of the hexagon.

(a) 82 cm (b)7 cm. (c) 24 cm (d) 4.2 cm

5. The distance covered by Jacob in completing one round of the square park with length of the side 3.5 cm

(a) 13 cm (b) 15 cm (c) 14 cm (d) 18 cm

6. The area of the square field is 84 m^2 , if the breadth of the field is 10 m then length of the field is

(a) 8 cm (b) 10 m (c) 8.4 m (d) 8.4 cm



7. The area of the rectangular park of length 25 m and breadth 12 m is

(a) 100 m^2 (b) 200 m^2 (c) 300 m^2 (d) 400 m^2

8. The cost of fencing a square park of side 250 m at the rate of ₹ 20 per metre is

(a) ₹ 10000 (b) ₹ 20000 (c) ₹ 30000 (d) ₹ 40000

9. The area of square plot of side 24 m is

(a) 156 m^2 (b) 48 m^2 (c) 576 m^2 (d) 476 m^2

10. The sides of a triangle are 12 cm and 14 cm. The perimeter of the triangle is 36 cm. The third side is

a) 10 cm (b) 12 cm (c) 14 cm (d) 14 CM

ii) Short answer type questions

1. The area of rectangular cardboard is 300 sq. m. If the length of the cardboard is 50 m then find the width of the cardboard?

2. The perimeter of a regular Pentagon is 300 cm. Find the length of each side of a Pentagon.

3. what is the of the tape required to rap over the rectangular frame of length 20 cm and width 15 cm?

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

5. A piece of thread is 60 cm long. What will be the length of each side if the thread is used to form a regular hexagon?

6. Find the cost of fencing an equilateral shaped park of side 125 m at the rate of ₹ 10 per metre.

7. Find the area of rectangle whose sides are 4 m and 1.5 m

8. A hall is 6 m long and 3 m wide. A square carpet of sides 4 m is laid on its floor. Find the area of the floor that is not carpeted?

9. A square of side 3 cm is cut from the rectangular cardboard of length 6cm and breadth 4 cm. Find the area of the remaining cardboard.?

10. Find the area in square metre of piece of cloth 1 m 25 cm wide and 2 m long.

iii) Long answer type questions

1. An Athlete A takes 15 rounds of rectangular park 50 m long and 25 m wide. Another Athlete B takes 20 round of Square Park of 30 m side. Which Athelete has covered more distance?

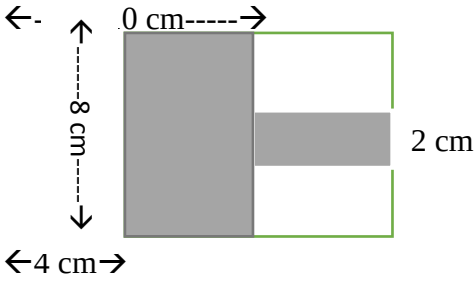
2. A farmer has a rectangular field of length and breadth 240 m and 180 m respectively. He wants to fence it with 2 rounds of rope. What is the total cost of the rope it the cost of 1 m of rope is ₹ 15.

3. What is the cost of tiling rectangular pieces of plot 1000m long and 400 m wide at the rate of ₹ 10 per hundred square metres?

4. A wall of length 12 m and breadth 10 m is to be whitewashed having the door of the dimensions 7m by 3m. Find the total cost of whitewashing the wall at the rate of ₹ 12 per m^2.

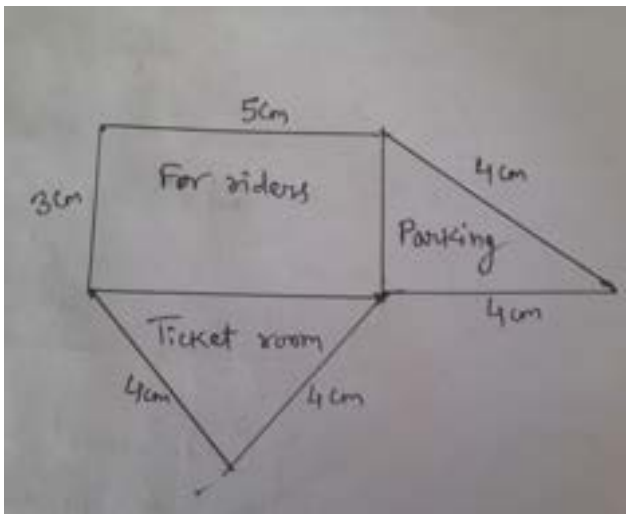
5. How many trees can be planted at a distance of 6 metres each around a rectangular plot whose length is 120 m and breadth is 90 m?

Q.6 Find the perimeter and area of the shaded portion in the given figure:



iv) Case based study

1. An excursion trip of students of class 6 of K V Khargone visited the amusement park. The map of the park is given below:



Now answer the following questions: (1 × 4 = 4 marks)

(i)The perimeter of the park is

(a)26 cm (b) 24 cm (c) 28 cm (d) 30 cm

(ii)The area for the riders is

(a) 10 cm^2 (b) 15 cm^2 (c) 20 cm^2 (d) 26 cm^2

(iii)The difference in the areas of riders and parking is

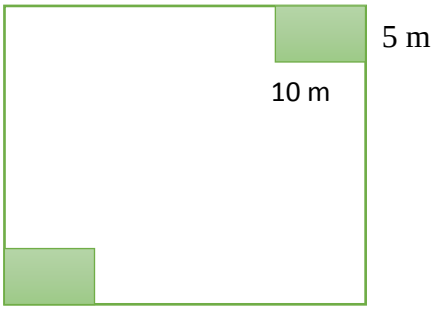
(a) 20 cm^2 (b) 9 cm^2 (c) 3 cm^2 (d) 5 cm^2

(iv)The shape of the ticket room is

Rectangle (b) Square (c) Isosceles triangle (d) equilateral triangle

2. A square shaped park ABCD of side 100m has two equal rectangular flower beds each of size 10m X 5m. With the help of the figure given below, answer the following questions:

←---------- 100 m---------→



(a) How much area do the two flower beds cover?
(b) Find the area of the park excluding the flower beds.
(c) Find the sum of the perimeter of the two flower beds.
(d) Find the ratio of area of the park to the area of the flower beds.

IV. ANSWERS

i. MCQs

1. (b) 6a cm2. (c) 25 cm3. (d) 8 cm4. (b) 7cm5. (c) 14 cm6. (c) 8.4 m

7. (c) 300 m28. (b) Rs. 20,0009. (c) 576 m210. (a) 10 cm

ii. Short answer type questions

1.6 m2.60 cm3.70 cm4.4 m5.10 cm6.Rs. 3,7507.6 m2

8.2 m29.15 cm210. 2.5 m2

iii. Long answer type questions

1. Athlete B2.Rs. 12,6003.Rs. 40,0004.Rs. 1,1885.70 trees

6.Perimeter = 36 cm, Area = 44 cm2

iv Case based study

1. (i) (b) 24 cm (ii) (b) 15 cm^2 (iii) (b) 9 cm^2 (iv) (d) equilateral triangle

2.(a) 100 m^2 (b) 9,900 m^2 (c) 60 m (d) 100 : 1

CHAPTER TEST 1

M.M.: 20 TIME: 40 MIN.

SECTION A (Each question carries 1 marks)

MCQs:

Q.1 Perimeter of a rectangle is
(a) $l \times b$ (b) b^2 (c) l^2 (d) $2 \times (l + b)$
Q.2 Area of a square with side 2.5 cm is
(a) 5 cm^2 (b) 10 m^2 (c) 625 cm^2 (d) 6.25 cm^2

Section B (Each question carries 2 marks)

Q.3 Find the distance travelled by Rubina if she takes four rounds of rectangular park length 45 m and breadth30 m.
Q.4 Find the perimeter of an equilateral triangle with sides 3.5 cm.
Q.5 The area of a square is 225 cm^2. Find the measure of each side.

Section C (Each question carries 4 marks)

Q.6 The total cost cultivating a rectangular field at Rs. 1.50 per square metre is Rs 1833. If the breadth of the field is 26 m , find the cost of fencing the field at Rs. 7.50 per metre.
Q.7 Anand's garden is 70 long m wide and is the form a rectangle if the uses three layers of barbed wire to fence the garden, what is the total length of the wire used?
Q.8 Samuel wants to erect some vertical stones along the boundary of his plot at a distance of 10 m each. If the length of the plot is 30 m and the breadth is 15 m how many stones are required?

CHAPTER TEST 2

M.M.: 30 TIME: 60 MIN.

SECTION A (Each question carries 1 marks)

MCQ:

Q.1 Neeta went to a park 20m long and 10 m wide. She took one complete round of it. The distance covered by her is

(a) 30 m (b) 60 m (c) 20 m (d) 10 m

Q.2 The area of a rectangular sheet of paper is 20 $cm^{2.}$ Its length is 5 cm. Find its width

(a) 1 cm (b) 2 cm (c) 3 cm (d) 4 cm

Section B (Each question carries 2 marks)

Q.3 Find the breadth of the rectangle whose area is 120 cm^2 and length is 15 cm.

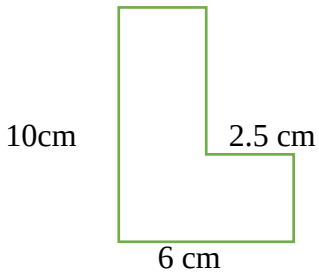
Q.4 An isosceles triangle has a measure of p units for its equal sides and q units for its unequal side. What is its perimeter?

Section C (Each questions carries 3 marks)

Q.5 Find the area of a square with perimeter 28 cm.

Q.6 the cost of fencing a square at the rate of Rs. 30 per metre is Rs. 27000. Find the length of each of each side of the square

Q.7 Find the perimeter of the given figure.



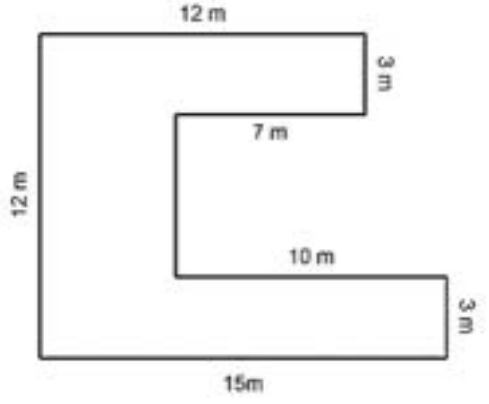
Q.8 In a square shaped park, whose side measures 28 m, a rectangular pond is located at the centre with dimensions 3 m and 2 m. What is the area of the park excluding the pond?

Section D (Each question carries 4 marks)

Q.9 How many square cm a glass will be required for windows, which has 10 panes, each measuring 25 cm by 16cm?

Q.10 The perimeter of a rhombus is 56 cm. If each of its side is halved, what will be the new perimeter?

Q.11 Jatin has a garden of the following shape.



He wants to fence his garden with the help of wire.

(a) Find the length of the wire required to fence it.

(b) Find the cost of fencing the garden, if the cost of 1 m of wire is Rs. 18.

(c) Jatin also wants to lay the grass beds across the whole garden. Find the area of the grass bed needed by Jatin.

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