Revision

First part

Number System :

Mathematician Ramanujan (Sri Nivash Ramanujan Ayenger, 1887–1920) frequently said, 'Numbers are my friend'; because from the begining of our "Pathsala" we meet these numbers everyday. So, they are our known friends.

Natural Number :

Numbers used for counting are counting numbers. As originating from fundamental concept of counting, these numbers are known as Natural Numbers.

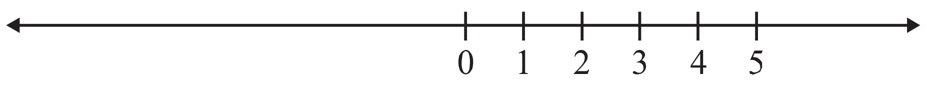
These are 1, 2, 3, 4, 5, 6, ...100,...... . Starting from 1, this can also be written as {1, 2, 3, 4, 5, ...}

Whole Number :

Including the number 0 (zero), with Natural numbers, the new set of numbers is known with a new name, "Whole Number."

Then in brackets the Whole numbers are {0, 1, 2, 3,.....}

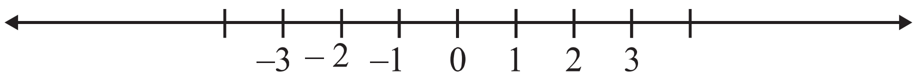
With the help of a number line we can determine the positions of whole numbers as follows –



Here, on a straight line, we take a fixed point, mark it with 0 (zero) and from that point marking at equal distances on right hand side we place 1, 2, 3, 4, ...

Integers :

Collection of numbers obatined by taking –1, –2, –3, ... against 1, 2, 3,....... and including 0 (zero) are known as Integers. Their positions on the number line are as shown below–



According as the positions of the Integers on the number line, they can be put inside a bracket as –

$$\{.............–3, –2, –1, 0, 1, 2, 3, 4, ...\}$$

Rational Numbers :

Numbers which can be put in the form $\frac{p}{q}$, Where p, q are integers with $q \neq 0$, are called Rational Numbers (Derivation of the name : whose mesurement can be obtained are Rational). For these numbers too, there are fixed positions on the number line. For example $\frac{1}{2}, \frac{1}{3}, \frac{2}{3}$ etc lie between 0 and 1 on the number line.

In analogy with the concept rational numbers, do irrational numbers exist.

Yes, there are numbers which cannot be put in the form $\frac{p}{q}$, $q \neq 0$ are irrational numbers. These number too have definite positions on the number line.

As in practical, rational and irrational numbers can be marked on the number line, so they are collectively named as Real Numbers, which include all rational and irrational numbers.

So, real number means { collection of all rational and irrational numbers.}

Fundamental Mathematical Operations :

The four fundamental mathematical (arithmetic) operations which are useful for real numbers are +, –, ×, ÷. With respect to these operations, real numbers obey some properties. Few such properties are mentioned below :

1. $a + 0 = a$, $\quad 0 + a = a$

   $a - 0 = a$ $\quad 0 - a = -a$

   $\frac{0}{a} = 0$, but $\frac{a}{0}$ is meaningless.

   and, $a.1 = 1.a = a$

2. $a + b = b + a$, $\quad$ but $a - b \neq b - a$

   $a.b = b.a$, $\quad$ but $a \div b \neq b \div a$

3. $a + (b + c) = (a + b) + c$

   $a. (b.c) = (a. b).c$

   Properties 2 and 3 mentioned above are not applicable (failed) with respect to subtraction and division.

4. $a. (b + c) = a.b + a.c$

   $(a + b).c = a.c + b.c$

For any distinct real number 'a', multiplication operation can also be expressed with the help of indices.

For example $a. a = a^2$ (square) $\quad a. a. a. = a^3$ (cube)

Simlarlly $\underbrace{a\ a\ a\ \ldots\ldots\ldots\ldots\ a}_{n\text{-terms}} = a^n$

a^n means nth power of a. n is the index of a and a is known as the base.

Laws of indices are –

1. $a^m \times a^n = a^{m+n}$
2. $a^m \div a^n = a^{m-n}$
3. $a^0 = 1$

4. $a^{-n} = \frac{1}{a^n}$

5. $\left(a^m\right)^n = a^{mn} = \left(a^n\right)^m$

6. $(ab)^m = a^m.b^m, \quad (a.b.c.)^m = a^m.b^m.c^m$

7. $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$

8. $\left(\frac{a}{b}\right)^{\frac{m}{n}} = \left[\left(\frac{a}{b}\right)^{\frac{1}{n}}\right]^m = \left[\left(\frac{a}{b}\right)^m\right]^{\frac{1}{n}}$

9. $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

Note :

1. The origin of natural number is 1 (one). Using addition operation with 1 we get 1+1=2, 2+1=3, 3+1=4 .... i.e. we get innumerable natural numbers. So, 1 is known as the generator of natural numbers.
2. Integers 2, 4, 6, ... are of the form $2.m$ (multiple of 2). So, these numbers are named as even numbers, where m is an integer.
3. Excluding all the even numbers from the collection of integers, the remaining integers are odd. Their general expression is $2m + 1$.

   [Now we can define even and odd integers with the help of division operation as – If an integer is completely divisiable by 2 then it is even, otherwise it is odd]
4. An integer can be expressed as the product of two or more integers, then they are known as the factors of the original integer.

   The integers which have only two factors and they are different (The factors are 1 and the number itself) are called Prime numbers.

   For Example $2 = 1\times2$; $5 = 5\times1$; $11 = 11\times1$ etc.

From the examples above, we can define Prime numbers as –

The numbers whose factors are 1 and the number itself are called Prime numbers.

Note : $1 = 1\times1$, means factors of 1 are 1 and itself, but 1 is not a prime number as the factors are not different.

5. 2 is the only even prime number. All other prime numbers are odd.
6. Two numbers (integers) are said to be coprime, if they have 1 as only their common factor.

Conversion from decimal fraction to $\frac{p}{q}$ form and its converse process.

Example 1 : Express 3.52 in $\left(\frac{p}{q}\right)$ form

Solution : $3.52 = 3 + \frac{5}{10} + \frac{2}{100} = \frac{300+50+2}{100} = \frac{352}{100}$

Example 2 : Express 3.523 in $\left(\frac{p}{q}\right)$ form

Solution : $3.523 = \frac{3523}{1000}$

Conversion of repeating decimal fraction to $\frac{p}{q}$ form.

Example 3 : Express $0.\dot{8}\dot{1}$ in $\frac{p}{q}$ form.

Solution : $0.\dot{8}\dot{1} = 0.81818181........$

Let $x = 0.818181......$ ⟶ (i)

$\therefore \; 100x = 81.818181..$ ⟶ (ii)

$99x = 81.0000$ [Subtracting (i) from (ii)]

$$x = \frac{81}{99} = \frac{9}{11}$$

Example 4 : Express $0.8\dot{1}$ in $\frac{p}{q}$ form.

Solution :

Let $x = 0.8\ 1\ 1\ 1\ 1\ 1\ 1.......$

$\therefore$ $10x = 8.1\ 1\ 1\ 1\ 1\ 1.....$ (1)

and $100x = 8\ 1.1\ 1\ 1\ 1\ 1\ 1....$ (2)

$\therefore$ $90x = 81 - 8$ [Subtracting (1) from (2)]

$$x = \frac{81-8}{90} = \frac{73}{90}$$

Example 5 : Express $3.8\dot{1}$ in $\frac{p}{q}$ form.

Solution $x = 3.8\dot{1}$

$$= 3 + .8\dot{1} = 3 + \frac{73}{90} \text{ (from example 3)}$$

$$= \frac{270+73}{90} = \frac{343}{90}$$

Percentage and Interest :

Percentage means out of hundred. Its symbol is %.

Begining from our day to day life, there are broad uses of percentage in higher Science, Statistics and Economics. The data expressed in large figure can be understood easily with the help of percentage. Conversely from the idea of out of hundred i.e. percentage, we can have the idea of the same for a very high figure. So, lets do a revisit to it–

Example-6 : Rs 2,450 is saved from Rs 5,000. What is its expression in percentage?

Solution : Savings on Rs 5000 is 2450

$\therefore$ Savings on Rs 100 $= \frac{2450 \times 100}{5000} = 49.$

Ans : Percentage of saving is 49%.

Example-7 : Express 49% in fraction.

Solution : $49\% = \frac{49}{100}$

Example-8 : Express $\frac{4}{5}$ in percentage

Solution : $\frac{4}{5} \times 100\% = 80\%$

Example-9 : Express 0.08 in percentage.

Solution : $0.08 = \frac{8}{100}$

$\therefore$ its percentage $= \frac{8}{100} \times 100\% = 8\%$

Or $0.08 \times 100\% = 8\%$

Example-10 : A number when reduced by 5% becomes 133. What is the number?

Solution : Let the number be x

Now, 5% of x means– $x \times \frac{5}{100} = \frac{5x}{100}$

When x in decreassed by 5% we have its value as $x - \frac{5x}{100}$

Now,

$$x - \frac{5x}{100} = \frac{100x - 5x}{100} = \frac{95x}{100}$$

According to the question,

$$\frac{95}{100}x = 133 \Rightarrow x = \frac{133 \times 100}{95} = 140$$

So, the number is 140.

Example-11 : In the seventeenth parliamentary election of the year 2019, 80% votes were casted in a constituency. A candidate won in the election securing 65% votes. If 572000 votes were casted in favour of him, then find the total number of voters in the constituency,

Solution : Let total number of voters in the constituency = x

80% of x votes were casted

i.e. $x \times \frac{80}{100} = \frac{4x}{5}$

Winner got votes = 65% of $\frac{4x}{5}$

$$= \frac{65}{100} \times \frac{4\boldsymbol{x}}{5}$$

$$= \frac{52\boldsymbol{x}}{100}$$

According to the question,

$$\frac{52x}{100} = 572000$$

$$x = \frac{572000 \times 100}{52} = 11,00,000$$

∴ total number of voters in the constituency = 11,00,000

Note : Percentage is very useful and essential in business (sale and buy). Percentage is the scale to understand profit and loss.

Example-12 : The sale price of an object is Rs 1800. If a profit of Rs 300 is gained after selling it, what is the percentage of profit.

Solution : [Note : Profit and loss are calculated on cost price. In the question, cost price is not mentiond. Lets find it]

Here,

Sale price = Rs. 1800.00

Profit = Rs. 300.00

∴ Cost price = Rs. 1500.00

Profit on Rs 1500 = Rs. 300

∴ Profit on Rs. 100 = $\frac{300 \times 100}{1500} = 20$

∴ Profit percent = 20%

Example-13 : By selling two electric fans of two different brands at Rs. 630 each, a shopkeeper earned 5% profit in one and on the otherhand he suffered 10% loss on the other fan. Find his overall profit or loss.

Solution : For the first fan

Sale price (Rs)	Cost price (Rs)
105	100
$\therefore$ 630	$\frac{100 \times 630}{105} = 600$

For the 2nd fan

Sale price (Rs)	Cost price (Rs)
90	100
630	$\frac{100 \times 630}{90} = 700$

Total cost price = Rs. (600 + 700) = Rs. 1300

And total sale price = Rs. 2 × 630 = Rs. 1260

$\therefore$ sale price < cost price by Rs. 45

$\therefore$ loss = Rs. 40

Percentage in Bank transactions :

Example-14 : To open "Naztaz Beauty purlour" Nazmina and Tazmina took a loan of Rs 9000 from a bank at 4% interest per anum. They decided to pay the interest monthly. How much interest they will have to pay every month ?

Solution :

Interest on Rs. 100 for 1 year = Rs. 4

$\therefore$ Interest on Rs. 9000 for 1 year $= \text{Rs. } 4 \times \frac{9000}{100} = \text{Rs. } 360$

$\therefore$ Interest in 12 months = Rs. 360

$\therefore$ Interest in one month $= \text{Rs. } \frac{1}{12} \times 360 = \text{Rs. } 30$

Example-15 : Saving Rs 3600 on interest, for 5 years, it becomes Rs 5220. How much money have to be deposited at the same rate to get an amount Rs. 47,270 in 7 years ?

Solution :

When principal is Rs 3600, the amount = Rs. 5220

$\therefore$ interest = Rs. (5220 – 3600)

= Rs. 1620

$\therefore$ interest on Rs. 3600 in 5 years = Rs. 1620

$\therefore$ interest on Rs. 100 in 1 year = Rs. $\frac{1620 \times 100}{3600 \times 5}$ = Rs. 9

From above, rate of interest = Rs. 9 per anum

2nd Part

Here, Amount = 47270, Time = 7 years, Rate of interest = 9%

$\therefore$ interest on Rs. 100 in 1 year = Rs. 9

$\therefore$ interest on Rs. 100 in 7 years = Rs. (9×7)

= Rs. 63

So, When principal is Rs. 100, amount = Rs. (100+63)

= Rs. 163

In 7 years if amount is Rs. 163, then principal = Rs. 100

In 7 years if amount is Rs. 1, then principal = Rs. $\frac{100}{163}$

$\therefore$ in 7 years if amount is Rs. 47,270, then princpal

$= \text{Rs.} \frac{100 \times 47270}{163}$

= Rs. 29,000

$\therefore$ Rs. 29,000 has to be deposited to get the amount Rs. 47, 270.

Note :

Interest, amount can also be obtained using following formulae.

P = Principal, I = Interest, r = Rate of interest, t = Time

A = Amount

$$I = \frac{P.r.t}{100}, \qquad A = P\left(1 + \frac{rt}{100}\right)$$

Exercise - R-1

1. Find the value of $\sqrt{2}$ upto two decimal places using square root.
2. Write two irrational numbers whose sum and product are rational.
3. Write all integers between –5 and 5 with the help of number line.
4. In the property of indices $a^m \div a^n = a^{m-n}$, taking $m = n$, show that $a^0 = 1$
5. In the property of indices $a^m \div a^n = a^{m-n}$, taking $m = 0$, show that $a^{-n} = \dfrac{1}{a^n}$
6. Find LCM and HCF of the following pairs of numbers using prime factorisation method.

   (i) 321, 396, (ii) 455, 42 (iii) 408, 170
7. Write two rational numbers between $\dfrac{2}{11}$ and $\dfrac{1}{6}$
8. Simplify $\sqrt{10} \times \sqrt{5}$ and find its approximate value taking $\sqrt{2} = 1.41$.
9. Express in $\dfrac{p}{q}$ from

   (i) $0.\dot{8}\dot{1}$ (ii) $0.1\dot{8}$ (iii) $2.4\dot{7}$ (iv) $2.44\dot{3}\dot{1}$
10. Simplify :

    (i) $\left(\sqrt{3}-\sqrt{2}\right)^2$ (ii) $\left(2\sqrt{3}+\sqrt{5}\right)\left(2\sqrt{3}-\sqrt{5}\right)$

    (iii) $\left(8+\sqrt{3}\right)\times\left(2+\sqrt{3}\right)$ (iv) $\dfrac{1}{1+\sqrt{2}}$

    (v) $\dfrac{4}{\sqrt{7}+\sqrt{3}}$ (vi) $\dfrac{7+\sqrt{3}}{7-\sqrt{3}}$

(vii) $\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}$ (viii) $\frac{\sqrt{a+x}-\sqrt{a-x}}{\sqrt{a+x}+\sqrt{a-x}}$

11. Prove that : $\frac{1}{2+\sqrt{3}}+\frac{2}{\sqrt{5}-\sqrt{3}}+\frac{1}{2-\sqrt{5}}=0$

12. Taking $\sqrt{3}=1.732$, $\sqrt{2}=1.414$, find the approximate values of the following.

(i) $\frac{1}{\sqrt{3}-\sqrt{2}}$ (ii) $\frac{2}{\sqrt{3}+\sqrt{2}}$

13. Without doing actual division, express the following rational numbers in decimal. [For example : $\frac{2}{25}=\frac{2\times 4}{25\times 4}=\frac{4}{100}=0.04$]

(i) $\frac{7}{25}$ (ii) $\frac{3}{40}$ (iii) $\frac{3}{100}$ (iv) $\frac{23}{5^2\times 2^3}$ (v) $\frac{14}{175}$

14. Express the following percentages in fractions :

(i) 53% (ii) 50% (iii) $\frac{1}{2}$% (iv) 100%

(v) 0.01%

15. Express the following fractions in percentages :

(i) $\frac{1}{2}$ (ii) 50 (iii) $\frac{1}{4}$ (iv) $\frac{3}{20}$ (v) $\frac{42}{125}$ (vi) 0.25 (vii) 1.25

16. An object is sold at a profit of 10%. What is the ratio of its cost price to sale price?

17. The cost price of 30 eggs is equal to the sale price of 20 eggs. What is the percentage of profit?

18. The cost price of an object is Rs. 2100. What is the sale price if it is sold with a profit of 10%?

19. Lemons are sold with 20% profit after buying 4 in Re. 1. What is the sale price of 1 lamon?

20. If an object is sold at Rs. 500, there is a loss of 5%. At what price it should be sold to gain a profit of 5%?

21. To attract customers a businessman offers a series of discounts at 10%, 10% and 5% respectively. What is equivalent discount of these three discounts?

● ● ●

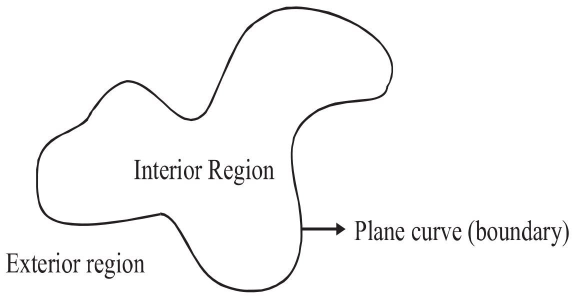
Second Part

Mensuration :

To maintain the continuity of the idea of mensuration, some concepts of previous classes are mentioned below.

Perimeter and Area :

Remind that a plane closed curve divides the whole plane in three regions– interior region of the closed curve, the boundry of the curve (i.e. the curve itself) and region exterior the curve.



From the figure it is understood that curve covers some parts or region of the paper. This region (interior region) is called the region covered by the curve. On the otherhand the closed curve itself is called the boundry of the region.

Using some scale (unit) of length, if the length of the boundary of the closed region can be found, it is called the perimeter. Again using some scale (unit) of area, if the region surrounded by the closed curve can be found, then that measure is known as the area of the region.

Using the concept of perimeter and area you have already learned to calculate the perimeter and area of some geometric figures.

In general,

Perimeter of a regular polygon = Length of one side × Number of sides

If number sides of a regular polygon is 4 then it is called a square.

Therefore, perimeter of square $= 4 \times l$

On the other hand, area of square $= l^2$,

If the number of sides of a polygon is 4, then it is a quadrilateral. When the opposite sides of a quadrilateral are equal and each interior angle is a right angle, then it is a rectangle.

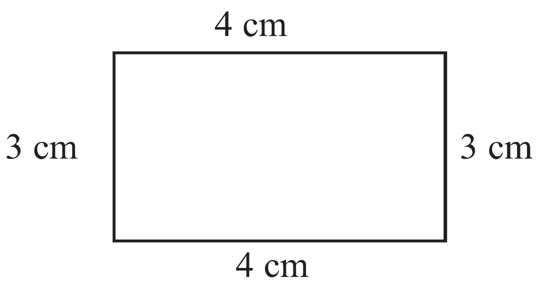
Perimeter of reactangle $= 2 \times (l + b)$

And area of rectangle $= l \times b$

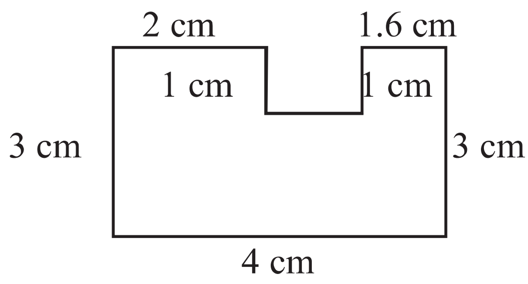
Where, l and b are the length and breadth of the rectangle.

Is there any certain relations between the perimeter and area of square and rectangle?

Mind the following figures –



(i)



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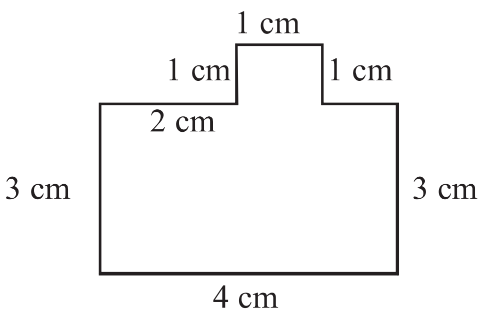
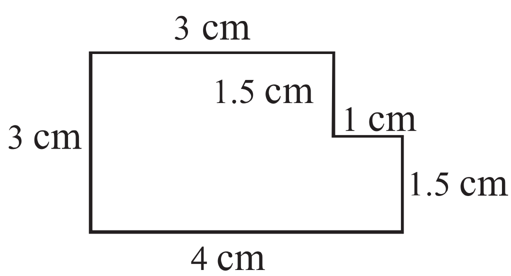


(iii)



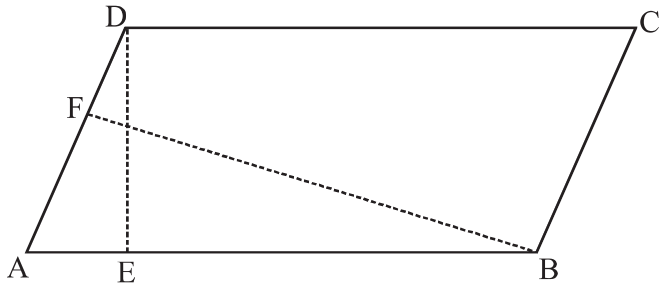
(iv)

Find the perimeter and area of each of the regions of the above figures.

You can find that regions having equal perimeter may have different areas [Perimeter of (i) = Perimeter of (iv) and Perimeter of (ii) = Perimeter of (iii)].

Area of parallelogram = base × height

Any side of a parallelogram can be considered as its base. Taking one side of a parallelogram as base, the distance between the base and the side parallel to it is considered as the height (altitude) of the parallelogram.

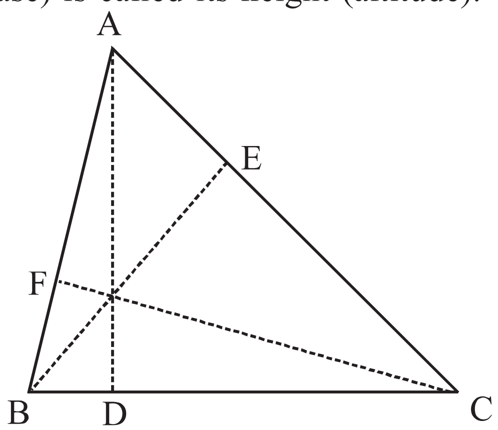


In the figure, if AB is considered as base then height is DE and if BC is considered as base then height is FB.

So, area of the parallelogram ABCD = AB × DE or BC × FB।

Area of tringle = $\frac{1}{2}$ base × height

Any side of a triangle can be considered as its base. If one side of a triangle is considered as base, then the perpendicular drawn from the opposite vertex to the side (base) is called its height (altitude).



In ΔABC, altitude with respect to the side BC is AD, altitude with respect to the side AC is BE and altitude with respect to the side AB is CF.

$$\therefore \text{ area of } \Delta ABC = \frac{1}{2} BC \times AD \text{ or } \frac{1}{2} AC \times BE \text{ or } \frac{1}{2} AB \times CF$$

Perimeter and Area of Circle :

Remember that a circle is a simple closed curve whose each point is equidistant (radius) from a fixed point (centre) on the plane. Total length of the curve is called the perimeter (circumference) and a line segment through the centre included between the closed curve is called the diameter of the circle.

The ratio of the perimeter to the diameter of any circle is a fixed number. It is denoted by π and its value is $\frac{22}{7}$ (approx.) So, if the perimeter is taken as c and diameter as d, then–

$$\frac{c}{d} = \pi \qquad \text{i.e. } c = \pi \times d$$

That is circumference or perimeter $= \pi \times$ diameter

$= 2\pi \times$ radius $= 2\pi r$, 'r' $\rightarrow$ radius of the circle ($d = 2r$)

Again area of the circle $= \pi r^2 = \pi \times (\text{radius})^2$

Example-1 : Find the perimeter and area of a plank of size 300 cm. × 30 cm.

Solution : Length = 300 cm.

Breadth = 30 cm.

Perimeter of the plank = 2 × (length + breadth)

= 2 × (300 + 30) cm. = 660 cm.

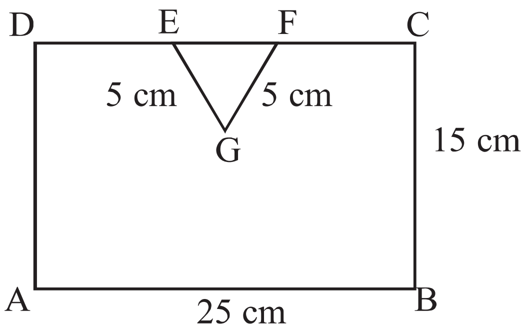
Area of the plank = length × breadth

= 300 × 30 sq.cm.

= 9000 sq.cm.

Example-2 : An equilateral triangle of side 5 cm., is cut out from any one of the edges of a rectangular piece of paper of size 25 cm. × 50 cm. Find the perimeter of the remaining part of the paper.

Solution :



Perimeter of the remaing part of the paper

$= AB + BC + CF + FG + GE + ED + DA$

$= DA + AB + BC + (CF + ED) + FG + GE$

$= DA + AB + BC + (DC - EF) + FG + GE$

$= 15 + 25 + 15 + (25 - 5) + 5 + 5$ cm.

$= 85$ cm.

Example-3 : From a wire which is in the form of square of size 30 cm. × 30 cm., a rectangle of length 40 cm. is formed. Find the bredth of the rectangle.

Solution : Here perimeter of the square and the rectangle are equal.

If the breadth of the rectangle is b then

Perimeter of the reactangle = 2 × (length + breadth)

$= 2 \times (40 + b)$

$= 80 + 2b$

Perimeter of the square= 4 × length of one side

$= 4 \times 30$ cm. $= 120$ cm.

$\therefore\ 2b + 80 = 120$ [$\therefore$ Perimeter of the square and the rectangle are equal]

Or $2b = 120 - 80 = 40$

Or $b = 20$

$\therefore$ breadth the rectangle = 20 cm.

Example-4 : The base and corresponding height of a parallelogrm are 5 cm. and 3 cm. Find its area.

Solution : Area of parallelogram = base × height

= 5 × 3 sq.cm.

= 15 sq.cm.

Example-5 : The length of one edge of a plank which is in the shape of a parallelogram is 180 cm. and the corresponding height is 25 cm. If the other height of the plank is 90 cm., then find the lenght of the corresponding edge.

Solution : Area of parallelogram = base × height

= 180 × 25 sq.cm.

= 4500 sq.cm.

If the length of the edge corresponding to the other side is l, then area of the plank will be $l \times 90$.

So, $l \times 90 = 4500$

or $l = \frac{4500}{90} = 50$

Length of the other edge = 50 cm.

Example-6 : The measures of the base and corresponding height of a triangle are 4 cm and 3 cm respectively. Find the area of the triangle.

Solution : Area of triangle = $\frac{1}{2}$ base × height

$= \frac{1}{2} \times 4 \times 3 \text{ cm}^2$

$= 6 \text{ cm}^2$

Example-7 : If the measures of the sides AB and BC of ΔABC are 5 cm and 8 cm and the height corresponding to the side AB is 6 cm, then find the height of the triangle corresponding to the side BC.

Solution : Area of $\Delta ABC = \frac{1}{2}$ base $\times$ height

$$= \frac{1}{2} \times 5 \times 6 \text{ cm}^2$$

$$= 15 \text{ cm}^2$$

If the height corresponding to the side BC is h then, area of ΔABC

$= \frac{1}{2}\ h \times 8$

$\frac{1}{2}\ h \times 8 = 15 \qquad \therefore\ h = \frac{15}{4}$

$$\therefore\ h = \frac{15}{4} \text{ cm.}$$

Example-8 : Find the perimeter of the circle whose radius is 7 cm.

Solution : Perimeter of the circle $= 2\pi \times$ radius

$$= 2 \times \frac{22}{7} \times 7 \text{ cm.}$$

$$= 44 \text{ cm.}$$

Example-9 : Find the area of the circle having perimeter 84 cm.

Solution : If the radius of the circle is r then

$2\pi r$ = perimeter (circumference) = 84

$$\therefore\ r = \frac{84}{2\pi} = \frac{42}{\frac{22}{7}} = \frac{21 \times 7}{11} = \frac{147}{11}$$

Area of the circle $= \pi r^2$

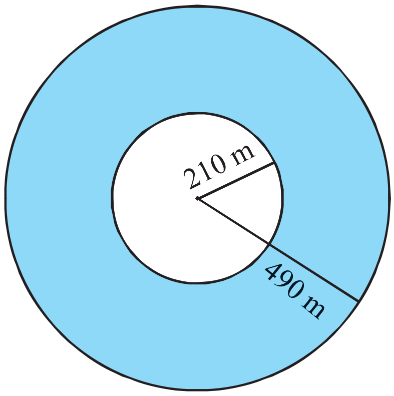
$$= \frac{22}{7} \times \left(\frac{147}{11}\right)^2 \text{ cm}^2$$

$$= \frac{22}{7} \times \frac{147 \times 147}{11 \times 11} \text{ cm}^2$$

$$= \frac{2 \times 21 \times 147}{11} \text{ cm}^2 = \frac{6,174}{11} \text{ cm}^2$$

Example-10 : Find the area of the region between two concentric circular paths. If the radii of the circular paths are 210 m. and 490 m. respectively.

Solution : Area of the outer circle



$= \pi\ (490)^2\ m^2$

$= \frac{22}{7} \times 490 \times 490\ m^2$

$= 22 \times 70 \times 490\ m^2$

$= 7,54,600\ m^2$

Area of the inner circle

$= \pi\ (210)^2\ m^2$

$= \frac{22}{7} \times 210 \times 210\ m^2$

$= 22 \times 30 \times 210\ m^2 = 1,38,600\ m^2$

Therefore area of the region inside the circular paths

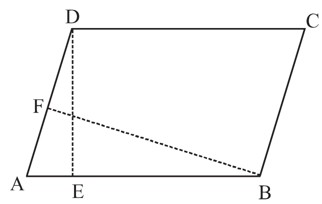
$= (7,54,600 - 1,38,600)\ m^2$

$= 6,16,000\ m^2$

Exercise - R-2

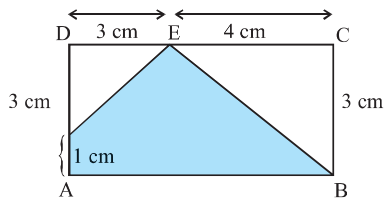
1. The area of a square shapped paddy field is 10000 sq. m. then its perimeter is—
   (a) 40 m (b) 100 m (c) 200 m (d) 400 m
2. The area of a court-yard of length 30 m. is 600 sq. m., the perimeter of the court-yard is —
   (a) 110 m (b) 115 m (c) 100 m (d) 125 m
3. The area of a rectangle of breadth 3 cm. is equal to the area of a square of side 9 cm. Then perimeter of the rectangle is —
   (a) 56 cm (b) 60 cm (c) 63 cm (d) 65 cm
4. The edge and corresponding height of a triangular glass placed over a table are 120 cm and 80 cm respectively. The area of the triangular glass is —
   (a) 4600 cm^2 (b) 4800 cm^2 (c) 4850 cm^2 (d) 4900 cm^2

5. The area of a triangle and one of its sides are 48 sq. cm. and 8 cm. respectively, then corresponding height of the triangle is —
   (a) 11 cm. (b) 12 cm. (c) 13 cm. (d) 14 cm.
6. The area of a triangle and its height with respect to some base are 1256 sq.mm. and 31.4 mm respectively, then length of the base is —
   (a) 40 mm (b) 45 mm (c) 50 mm (d) 35 mm
7. The perimeter of a circle of diameter 10 cm is —
   (a) 30.4 cm. (b) 30.14 cm. (c) 31.4 cm. (d) 30.01 cm.
   (Take $\pi = 3.14$)
8. The perimeter of a circular court-yard is 154 m. The area of the court-yard is—
   (a) 75 cm.^{2} (b) 77 cm.^{2} (c) 76 cm.^{2} (d) 78 cm.^{2}
9. The area of a circular plate is 77.5 cm^2, what is diameter of the plate?
   (a) 5 cm. (b) 6 cm. (c) 7 cm. (d) 8 cm.
10. The area of a disc is 616 sq. cm., its perimeter is —
    (a) 80 cm. (b) 89 cm. (c) 88 cm. (d) 90 cm
11. The perimeter of a rectangle is 120 cm. and it length is 40 cm. Find the area of the rectangle.
12. The measure of an wall of a room is 4.5 m. × 3.6 m. and a part of measure 2m × 1m of it (wall) is kept blank for a door. Find the exact area of the wall to colour it.
13. A square is formed from a 10 cm long wire. If with the same wire a rectangle of length 12 cm is formed then what is the breadth of the rectangle? Which figure will have more area? Square or rectangle?
14. In the adjacent figure, ABCD is a parallelogram. The measures of AB and BC are 6 cm and 4 cm respectively. If the measure of the height BF with respect to the base AD is 4.9 cm. then find the height DE of the parallelogram with respect to the base AB.

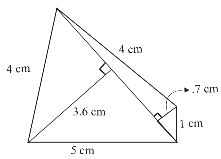


15. Area of triangle ΔABC is 30 cm^2. and measure of its height AD with respect to the base BC is 10 cm. Find the measure of BC.

16. The measure of the sides PR and QR of ΔPQR are 4 cm and 8 cm. respectively. If the length of height PL with respect to the base QR is 5 cm., then find the heigth QM with respect to the base PR.
17. The measure of the height AD of a ΔABC with respect to the base BC is 4 cm. P is a point on BC such that BP = 3 cm. and arΔABP = arΔAPC. Find the measure of PC.
18. The radius of a semi-circular garden is 10m, find the area of the garden. (Take $\pi = 3.14$)
19. From a circular region of radius 4 cm., a circle of radius 3 cm. is cut out. Find the area of the remaining part of the bigger circle.
20. A circular shape is obtained from a 44 cm long wire. What is the radius of the circle?
21. The length of a minute hand of a clock is 20 mm. Find the distance covered by the tip of the minute hand in half an hour.
22. There is a path of width 5 m. around a square shaped park of length 100 m. Find the area of the park.
23. There is a path of width 6 m. along the outer boundary of a rectangular crop field of length 180 m. and bredth 120 m. Find the area of the path.
24. Find the area of the shaded region of the following figure



25. Find the area of the following quadrilateral.



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