SUBJECTIVE TYPE QUESTIONS

(MATHEMATICS)

Lesson- 1
REAL NUMBERS
(3 marks questions)

Q 1. Use Euclid's algorithm to find the HCF of 6 and 20.

Solution: $20=6\times3+2$

$6=2\times3+0$

remainder= 0 and divisor= 2

HCF= 2

Q 2. Use Euclid's algorithm to find the HCF of 65 and 135.

Solution: $135=65\times2+5$

$65=5\times13+0$

remainder = 0 and divisor= 5

HCF (65,135) =5

Q 3. Express 20 as prime factors.

2	20
2	10
5	5
	1

Solution: $20=2\times2\times5$

$=2^2\times5^1$ ans.

Q 4. Express 156 as prime factors.

Solution: $156 = 2\times2\times3\times13$

2	156
2	78
3	39
	13

$=2^2\times3^1\times13^1$ ans.

Q 5. Find the LCM of 18 and 12

2	18
3	9
3	3
	1

2	12
2	6
3	3
	1

Solution: $18 = 2\times3\times3$

$=2^1\times3^2$

$12 = 2\times2\times3$

$=2^2\times3^1$

LCM = Product of the greatest po-wer of each prime factor

$LCM = 3^2 \times 2^2 = 3\times3\times2\times2 = 36$

Q 6. Express $\frac{30}{8}$ into decimal form.

2	30
3	15
5	5
	1

2	8
2	4
2	2
	1

Solution: $$\frac{30}{8} = \frac{2^1\times3^1\times5^1}{2\times2\times2} = \frac{2^1\times3^1\times5^1}{2^3}\times\frac{5^3}{5^3} = \frac{2^1\times3^1\times5^1\times5^3}{2^3\times5^3}$$

$$= \frac{2\times3\times5\times5\times5\times5}{10\times10\times10} = \frac{2\times3\times5\times5^3}{10^3} = \frac{3750}{1000} = 3.75$$

Q 7. Express 0.75 as rational number.

Solution: $0.75 = \frac{75}{100}$ Ans.

Q 8. Identify the rational and irrational numbers.

(i) $\frac{75}{2}$ (ii) $\sqrt{2}$ (iii) 0.375

Solution: rational numbers = $\frac{75}{2}$ 0.375

irrational number= $\sqrt{2}$

(4 marks Questions)

Q 9. Find the LCM of 8, 9 and 25.

Solution:

$$8 = 2 \times 2 \times 2 = 2^3$$
$$9 = 3 \times 3 = 3^2$$
$$25 = 5 \times 5 = 5^2$$

LCM = Product of the greatest power of each prime factor involved in the numbers.

$$LCM = 2^3 \times 3^2 \times 5^2 = 8 \times 9 \times 25 = 180$$

Q 10. Find the HCF of 15,12 and 21

Solution :

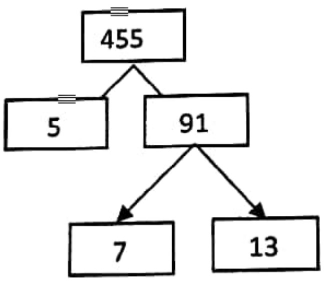
$$15 = 3 \times 5 = 3^1 \times 5^1$$
$$12 = 2 \times 2 \times 3 = 2^2 \times 3^1$$
$$21 = 3 \times 7 = 3^1 \times 7^1$$

HCF = Product of the smallest power of each common prime factor in the number.

HCF = $3^1 = 3$

Q 11. Express 455 as a product of prime factors (using factor tree method)

Solution:

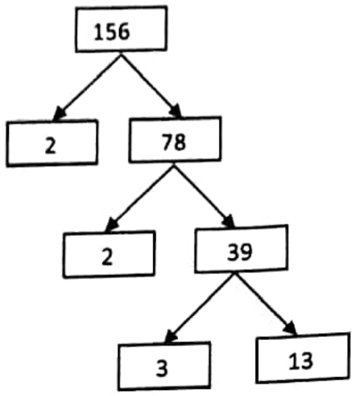


5	455
7	91
13	13
	1

$455 = 5 \times 7 \times 13$

Q 12. Express156 as a product of prime factor. (By using factor tree method)

Solution:



2	156
2	78
3	39
13	13
	1

$\therefore 156 = 2\times2\times3\times13$

Q 13. Given that HCF (26, 91) = 13, find LCM (26, 91)

Solution: HCF × LCM = First number× Second number

$13 \times LCM = 26\times91$

$LCM = \frac{26\times91}{13} = 182$

LCM (26, 91) = 182

Q 14. Given that HCF (15, 25) = 5, find LCM (15, 25)

Solution: HCF × LCM = first number× second number

$5 \times LCM = 15\times25$

$LCM = \frac{15\times25}{5} = 75$

LCM=75

Q 15. Find the HCF and LCM of 6, 72 and 120, using the prime factorization method.

Solution: $6 = 2\times3 = 2^1\times3^1$

$72 = 2\times2\times2\times3\times3 = 2^3\times 3^2$

$120 = 2\times2\times2\times3\times5 = 2^3\times3^1\times5^1$

$LCM = 2^3\times 3^2\times5^1 = 2\times 2\times 2\times 3\times3\times5 = 360$

2	72
2	36
2	18
3	9
3	3
	1

2	120
2	60
2	30
3	15
5	5
	1

=360

Q 16. Explain why 7×11×13+13 is composite number.

Solution: $7\times11\times13+13 = 13\ (7\times11+1)$

$= 13\ (77+1)$

$= 13\times78$

$= 13\times13\times3\times2$

2	78
3	39
13	13
	1

It is product of prime numbers.

∴ 7×11×13+13, is composite number

Lesson- 2
POLYNOMIALS
(3 marks questions)

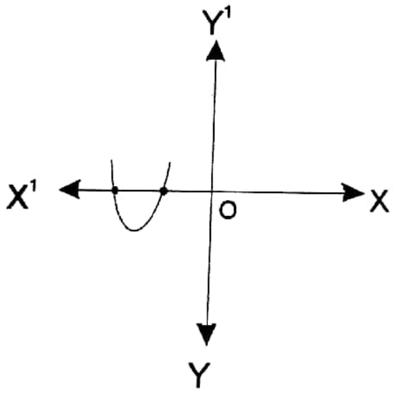
Q 1. Write the formula of sum and product of zeroes of quadratic polynomial ax^2bx+c whose zeroes are α and β

$$\alpha + \beta = \frac{-(coefficient\ of\ x)}{cofficient\ of\ x^2}$$

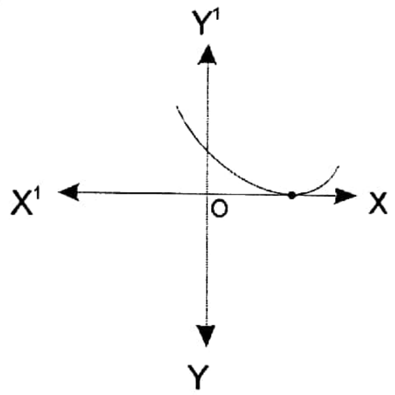
$$\alpha + \beta = \frac{constant\ term}{cofficient\ of\ x^2}$$

Q 2. Given below the graph of $y = p(x)$, where $p(x)$ is a polynomial. Find the number of zeroes of p(x).

(i)



(ii)



Solution:

(i) The number of zeroes is 2 as the graph intersects the x-axis at two points.
(ii) The number of zeroes is 1 as the graph intersects the x-axis at one point only.

3. Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$

Solution: $x^2 + 7x + 10$

$= x^2 + 5x + 2x + 10$

$= x(x+5) + 2(x+5)$

$= (x+5)(x+2)$

So the value of $x^2 + 7x + 10$ is zero

when $x + 5 = 0$ or $x + 2 = 0$

$\therefore x = -5$ or $x = -2$

The zeroes of $x^2 + 7x + 10$ are -5 and -2

Q 4. Find the zeroes of the quadratic polynomial $x^2 - 2x - 8$

Solution: $x^2 - 2x - 8$

$= x^2 - 4x + 2x - 8$

$= x(x-4)+2(x-4)$

$= x(x-4)(x+2)$

So the value of equation x^2-2x+8 is zero

when $x-4=0$ or $x+2=0$

$\therefore x=4$ or $x=-2$

The zeroes of equation x^2-2x+8 are 4 and -2

Q 5. Divide x^2-2x-3 by $x-1$

Solution:

```
x-1 ) x²-2x-3 ( x-1
      x² - x
      -  +
      ---------
           -x -3
           -x +1
           +  -
           ------
reminder     -4
```

Ans : Quotient$= x-1$ and remainder$=-4$

Q 6. Find the sum and product of zeroes of the polynomial whose zeroes are 4 and -2.

zeroes are $\alpha=4$ and $\beta=-2$

Sum of zeroes $=\alpha+\beta=4-2=2$

product of zeroes$=\alpha\beta=4\times-2=-8$

Q 7. Find the zeroes of the quadratic polynomial x^2-4

Solution: x^2-4

$=(x^2)-(2)^2$

$=(x+2)(x-2)$

The value of x^2-4 is zero

When $x+2=0$ or $x-2=0$

$x=-2$ or $\boldsymbol{x}=\mathbf{2}$

-2 and 2

Q 8. Divide $2x^2+3x+1$ by $x+2$

Solution:

```
x+2 ) 2x²+ 3x+1 ( 2x-1
      2x²+ 4x
      -    -
      ---------
           -x +1
           -x -2
           +  +
           ------
reminder      3
```

Ans.: quotient $=2x-1$ and remainder$=3$

4 marks questions

Q 9. Divide $x^3 - 3x^2 + 5x - 3$ by $x^2 - 2$

Solution:

$$x^2-2 \overline{)\, x^3 - 3x^2 + 5x - 3\,(}\; x-3$$

$$\begin{array}{l} x^3 \quad\quad - 2x \\ \underline{- \quad\quad + \quad\quad} \\ \quad -3x^2 + 7x - 3 \\ \quad -3x^2 \quad\quad + 6 \\ \quad \underline{+ \quad\quad\quad -} \\ \text{reminder} \quad 7x - 9 \end{array}$$

Answer: quotient $= x-3$ and remainder $= 7x-9$

Q 10. Find a quadratic polynomial, the sum and product of whose zeroes are -3 and 2 respectively.

Solution: let α and β are zeroes of the quadratic polynomial.

$\therefore \alpha+\beta = -3 = \frac{-b}{a} \therefore \Rightarrow$ If $a=1$ then $b=3$ and $c=2$

$\alpha.\beta = 2 = \frac{c}{a}$

Quadratic Polynomial $= ax^2 + bx + c$

Answer: $x^2 + 3x + 2$

Q 11. Find sum and product of zeroes of a quadratic polynomial $x^2 - 9$

Solution: $x^2 - 9$

$= (x)^2 - (3)^2$

$= (x+3)(x-3)$

$x+3 = 0$ or $x-3 = 0$

$x = -3$ or $x = 3$

Zeroes are -3 and 3

Sum of zeroes $= -3+3 = 0$

Product of zeroes $-3 \times 3 = -9$

Q 12. Find a quadratic polynomial, the sum and product of whose zeroes are 1 and -1 respectively

Solution : let α and β are zeroes of a quadratic polynomial.

$\alpha+\beta = \frac{-b}{a} \Rightarrow$ if $a=1$ then $b=3$ and $c=1$

$\alpha.\beta = \frac{c}{a} = 1 \Rightarrow$

Quadratic polynomial $= ax^2 + bx + c = x^2 - x + 1$

Q 13. Find the sum and product of the zeroe of $x^2 + 7x - 3$

Solution : Sum of zeroes $\alpha + \beta = -\frac{(\textit{coefficient of } x)}{\textit{coefficient of } x^2}$

Product of zeroes $\alpha.\beta = -\frac{\textit{costant term } x}{\textit{coefficient of } x^2} = \frac{-3}{1}$

Q 14. Find the zeroes of the quadratic polynomial $6x^2-7x-3$, and verify the relationship between the zeroes and the co-efficients.

Solution : $6x^2-7x-3$

$= 6x^2-9x+2x-3$

$= 3x^2(2x-3)+1(2x-3)$

$= (3x+1)(2x-3)$

$\therefore 3x+1=0$ or $2x-3=0$

$3x=-1$ or $2x=3$

$x=\frac{-1}{3}$ or $x=\frac{3}{2}$

Sum $\alpha+\beta=\frac{3}{2}-\frac{1}{3}=\frac{9-2}{6}=\frac{7}{6}$

Sum $=\frac{-b}{a}=\frac{-(-7)}{6}=\frac{7}{6}$

$\alpha.\beta=\frac{3}{2}\times\frac{-1}{3}=\frac{-1}{2}$

$\frac{c}{a}=\frac{-3}{6}=-\frac{1}{2}$

Q 15. Which of the following are the quadratic polynomials.

(i) $2y^2-3y+4$ (ii) $\frac{1}{x-1}$

(iii) $x^2-4x-\sqrt{2}$ (iv) $\sqrt{3}x+2x^2+1$

A polynomial of degree 2 is called quadratic polynomial.

(i) (iii) and (iv) are quadratic polynomials.

Q 16. Whether 2x-3 is factor of $6x^2$-7x-3

$$
\begin{array}{r|l}
2x-3 & 6x^2-7x-3 \quad (\,3x+1 \\
 & 6x^2-9x \\
 & \underline{-\quad +} \\
 & \quad 2x-3 \\
 & \quad 2x-3 \\
 & \quad \underline{-\quad +} \\
\text{remainder} & \quad 0
\end{array}
$$

Ans : remainder is zero, therefore, $2x-3$ is a factor of $6x^2$-7x-3

Lesson-3
PAIR OF LINEAR EQUATIONS IN TWO VARIABLES
(3 marks questions)

Q 1. In equation $x+y=10$ if $x=2$ then find value of y

Solution: Given $x+y=10$

Put value of x

$2+y=10$

$y=10-2=8$

$\therefore$ value of y = 8

Q 2. In equation $2x+3y=14$, if $y=2$ then find the value of x

Solution: $2x+3y=14$

put value of y

$2x+3(2)=14$

$2x+6=14$

$2x=14-6=8$

$x=\frac{8}{2}=4$

$\therefore$ value of x = 4

Q 3. By comparing the co-efficients of the pairs of linear equations $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$, define, which type of solution of these linear equation graphically?

Solution: (i) if $\frac{a_1}{a_2}\neq\frac{b_1}{b_2}$ then interesting lines.

(ii) if $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$ then lines coincide.

(iii) if $\frac{a_1}{a_2}=\frac{b_1}{b_2}\neq\frac{c_1}{c_2}$ then lines are parallel.

Q 4. By comparing the coefficients of the pairs of linear equations $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$ define, which type of solution of these linear equation graphically.

Solution: (i) if $\frac{a_1}{a_2}\neq\frac{b_1}{b_2}$ then unique solution

(ii) if $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$ then infinitely many solutions

(iii) if $\frac{a_1}{a_2}=\frac{b_1}{b_2}\neq\frac{c_1}{c_2}$ then no solution

Q 5. In equations $5x+7y+12=0$ and $4x+8y+5=0$, write the value of $a_1, a_2, b_1, b_2, c_1, c_2$

$a_1=5$ and $a_2=4$

$b_1 = 7$ $\qquad$ $b_2 = 8$

$c_1 = 12$ $\qquad$ $c_2 = 5$

Q 6. In equations $2x+3y=8$ and $4x+6y=9$,write the value of $a_1, a_2, b_1, b_2, c_1, c_2$

Solution: $a_1 = 2$ and $a_2 = 4$

$b_1 = 3$ $\qquad$ $b_2 = 6$

$c_1 = 8$ $\qquad$ $c_2 = 9$

Q 7. Find out whether the pair of linear equations $5x+4y+8=0$ and $7x+6y+9=0$ has unique solution or not ?

Solution: $\frac{a_1}{a_2} = \frac{5}{7}$, $\frac{b_1}{b_2} = \frac{4}{6}$ and $\frac{c_1}{c_2} = \frac{8}{9}$

$\because \frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ $\therefore$ equations has unique solution.

Q 8. Whether graphical representation of the pair of equations $2x+3y+9=0$ and $4x+6y+18=0$ coincident or not?

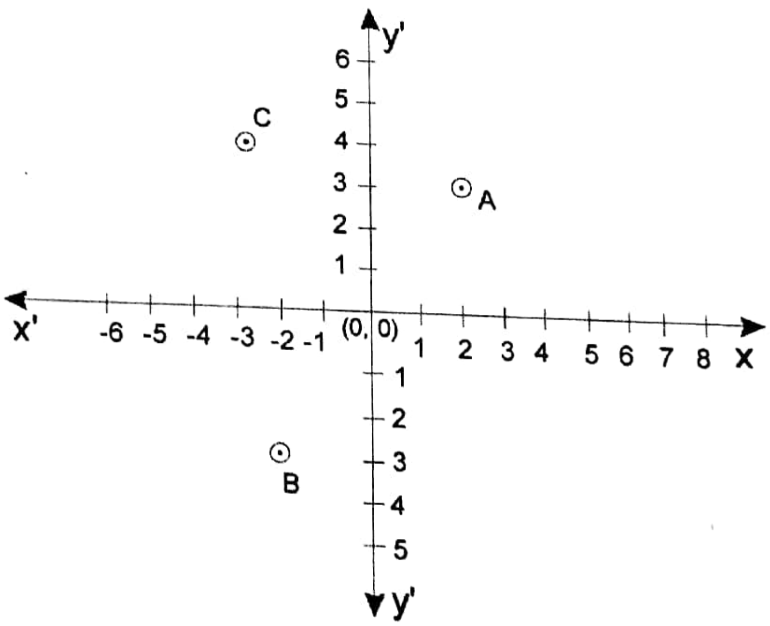
Solution: $\frac{a_1}{a_2} = \frac{2}{4} = \frac{1}{2}$

$\frac{b_1}{b_2} = \frac{3}{6} = \frac{1}{2}$

$\frac{c_1}{c_2} = \frac{9}{18} = \frac{1}{2}$

$\therefore \frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ $\therefore$ graphically lines coincide

Q 9. Find the coordinates of points A, B and C from the following given graph.



Solution:

A (2,3)
C (-3,4)
B (-2,-3)

(4 marks questions)

Q 10. Solve the pair of equations $x+y=5$ and $x-y=15$

Solution: $x+y=5$

add $x-y=15$

$$2x=20$$

$$x=\frac{20}{2}=10$$

$$x=10$$

$$x+y=5$$

$$10+y=5 \quad \text{(put value of } x\text{)}$$

$$y=5-10$$

$$y=-5$$

$x=10$ and $y=-5$

Q 11. Solve the pair of linear equations $x+3y=6$ and $2x-3y=12$

Solution: $x+3y=6$

$2x-3y=12$

$$3x \quad =18$$

$$x=\frac{18}{3}=6$$

$$x+3y=6$$

$$6+3y=6 \quad \text{(by putting value of } x\text{)}$$

$$3y=6-6=0$$

$$y=\frac{0}{3}=0$$

$$y=0$$

$x=6$ and $y=0$

Q 12. On comparing the ratio of coefficients of pair of equations $5x+6y+7=0$ and $7x+12y+8=0$, find out whether the lines representing the graph intersect at a point, are parallel or coincident.

Solution: $5x+6y+7=0$

$7x+12y+8=0$

$$\frac{a_1}{a_2}=\frac{5}{7}, \quad \frac{b_1}{b_2}=\frac{6}{12}=\frac{1}{2}, \quad \frac{c_1}{c_2}=\frac{7}{8}$$

$$\therefore \frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

$\therefore$ Lines intersect at a point and system has unique solution. Intersecting point is the solution of the equations.

Q 13. 5 pencils and 7 pen together cost ₹50, whereas 7 pencils and 5 pens together cost ₹ 46. Find the cost of one pencil and that of one pen.

Solution: Let cost of one pencil= ₹ x

cost of one pen = ₹ y

$\therefore$ $(5x+7y=50)\times 7$

$(7x+5y=46)\times 5$

$35x+49y=350$

$35x+25y=230$

$- \quad - \quad -$

$24y=120$

$\therefore \quad y=\frac{120}{24}=5$

Put $y=5$ in equation $5x+7y=50$ we get

$5x+7(5)=50$

$5x=50-35$

$5x=15$

$x=\frac{15}{5}=3$

$\therefore$ cost of one pencil= ₹ 3

cost of one pen= ₹ 5

Q 14. The cost of 5 oranges and 3 apples is ₹ 35 and the cost of 2 oranges and 4 apples is ₹ 28. Find the cost of an orange and an apple.

Solution: let cost of an orange =₹ x

cost of an apple=₹ x

according to question:

$5x+3y=35)]\times 2$

$2x+4y=28)]\times 5$

$\not{-}14y=\not{-}70$

$y=\frac{70}{14}=5$

$5x+3y=35$

$5x+3(5)=35$ (put value of y)

$5x+15=35$

$5x=35-15=20$

$x=\frac{20}{5}=4$

$\therefore$ cost of an orange= ₹4

cost of an apple= ₹5

Q 14. For which value of P does the pair of equations given below has unique solutions?

$4x + py + 8 = 0$ and $2x + 2y + 2 = 0$

Solution: $\frac{a_1}{a_2} = \frac{4}{2} = \frac{2}{1}, \frac{b_1}{b_2} = \frac{p}{2}, \frac{c_1}{c_2} = \frac{8}{2} = \frac{4}{1}$

For unique solution: $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

$$\frac{2}{1} \neq \frac{p}{2}$$

$p \neq 4$

Q 15. The difference between two numbers is 26 and one number is three times the other. Find them.

Solution: Let one number $= x$

second number $= y$

according to question: $x - y = 26 ----(i)$

and $x = 3y ----(ii)$

put value of x in (i) we get

$3y - y = 26$

$2y = 26$

$y = \frac{26}{2} = 13$

Put value of y in equation $x - y = 26$

$x - 13 = 26$

$x = 26 + 13 = 39$

first number = 39

second number = 13

Q 16. Solve the pair of equation $x + 2y - 4 = 0$ and $2x + 4y - 12 = 0$ graphically

Solution: $x + 2y - 4 = 0$

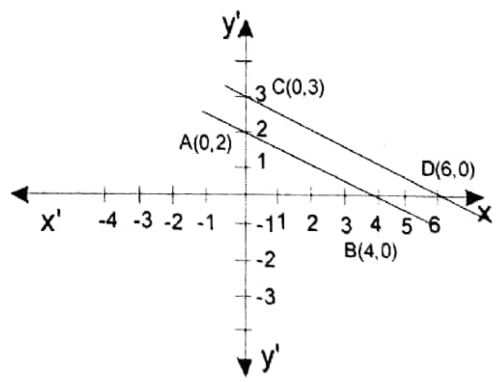
A B

x	0	4
y	2	0

$2x + 4y - 12 = 0$

C D

x	0	6
y	3	0



We observe from graph that lines are parallel.

∴ pair of equation has no solution

Lesson -4

QUADRATIC EQUATIONS

(3 marks equations)

Q 1. (i) Write the standard form of a quadratic equation.

(ii) Write the formula of discriminant (D) of the quadratic equation.

Solution: (i) $ax^2+bx+c=0$ where $a\neq 0$

(ii) $D=b^2-4ac$

Q 2. Check whether $(x+1)^2=7$ is quadratic equations?

Solution: $(x+1)^2=7$

$x^2+2x+1=7$

$x^2+2x+1-7=0$

$x^2+2x-6=0$

highest power of x = 2

$\therefore (x+1)^2=7$ is a quadratic equation.

Q 3. Check whether $x^2-2x=-x(3-x)$ is a quadratic equation?

Solution: $x^2-2x=-x(3-x)$

$x^2-2x=-3x+x^2$

$x^2-2x+3x-x^2=0$

$x=0$

highest power of x = 1

$x^2-2x=-x(3-x)$ is not a quadratic equation.

Q 4. Find the roots of the quadratic equation $x^2-3x-10=0$ by factorisation

Solution: $x^2-3x-10=0$

$x^2-5x+2x-10=0$

$x(x-5)+2(x-5)=0$

$(x-5)(x+2)=0$

$(x-5)$ or $(x+2)=0$

$(x-5)$ or $x=-2$

$x=5,-2$

roots of the quadratic equation are 5 and -2

Q 5. Find the discrimination of the quadratic equation $x^2+5x+2=0$

Solution: $x^2+5x+2=0$

$ax^2+bx+c=0$ (standard form)

$\therefore a=1, b=5, c=2$

$D=b^2-4ac$

$=(5)^2-4(1)(2)$

$=25-8=17$

D = 17

Q 6. Write the conditions of nature of roots of $ax^2+bx+c=0$

Solution: For quadratic equation $ax^2+bx+c=0$

$$D=b^2-4ac$$

(1) if $b^2-4ac>0$ then two distinct real roots.

(2) if $b^2-4ac=0$ then two equal real roots.

(3) if $b^2-4ac<0$ then no real roots.

Q 7. Are the roots of quadratic equation $x^2-2x+1=0$ equal?

Solution: $x^2-2x+1=0$

$ax^2+bx+c=0$

$a=1, b=-2, c=1$

$D=b^2-4ac$

$=(-2)^2-4(1)(1)$

$=4-4=0$

$\because D=0$

$\therefore$ roots are real and equal .

Q 8. Are roots of the quadratic equation $y^2-11y+30=0$ are real?

Solution: $y^2-11y+30=0$

$ay^2+by+c=0$

$a=1, b=-11, c=30$

$D=b^2-4ac$

$=(-11)^2-4(1)(30)$

$=121-120=1$

$\because D>0$

$\therefore$ roots are real.

(4 Marks question)

Q 9. Are roots of the quadratic equation $2x^2-7x+3=0$ exist?

Solution: $2x^2-7x+3=0$

$ax^2+bx+c=0$

$a=2, b=-7, c=3$

$D=b^2-4ac$

$=(-7)^2-4(2)(3)$

$=49-24=25$

$\because D>0$

$\therefore$ roots are real, therefore they exist

Q 10. Find the nature of the roots of quadratic equation $(x-2)^2=0$ and find them.

Solution: $(x-2)^2=x^2-4x+4=0$

$D=b^2-4ac$

$= (-4)^2 - 4(1)(4)$

$16 - 16 = 0$

$D = 0$

$\therefore$ Roots are real and equal

$(x-2)^2 = 0$

$(x-2)(x-2) = 0$

$x - 2 = 0$ or $x - 2 = 0$

$x = 2$ or $x = 2$

$x = 2, 2$

$\therefore$ roots are 2, 2

Q 11. Find the roots of equation $3x^2 - 5x + 2 = 0$ by using quadratic formula.

Solution: $3x^2 - 5x + 2 = 0$

$ax^2 + bx + c = 0$

$a = 3, b = -5, c = 2$

$D = b^2 - 4ac$

$= (-5)^2 - 4(3)(2)$

$= 25 - 24 = 1$

Now $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \dfrac{-(-5) \pm \sqrt{1}}{2(3)}$

$= \dfrac{5 \pm 1}{6}$

$x = \dfrac{5+1}{6} = \dfrac{6}{6} = 1$

$x = \dfrac{5-1}{6} = \dfrac{4}{6} = \dfrac{2}{3}$

$x = 1, \dfrac{2}{3}$

Q 12. Find the roots of the quadratic equation $x^2 - 2x - 8 = 0$

Solution: $x^2 - 2x - 8 = 0$

$a = 1, b = -2, c = -8$

$D = (b)^2 - 4ac$

$= (-2)^2 - 4(1)(-8)$

$= 4 + 32 = 36$

$x = \dfrac{-b \pm \sqrt{D}}{2a} = \dfrac{2 \pm \sqrt{36}}{2 \times 1} = \dfrac{2 \pm 6}{2}$

$x = \dfrac{2+6}{2} = \dfrac{8}{2} = 4$

$$x = \frac{2-6}{2} = \frac{-4}{2} = -2$$

the roots of the quadratic equation $x^2 + 2x - 8 = 0$ are 4 and -2

Q 13. Find the roots of the quadratic equation $2x^2 + x - 6 = 0$, if possible?

Solution: $2x^2 + x - 6 = 0$

$a = 2, b = 1, c = -6$

$D = b^2 - 4ac$

$= (1)^2 - 4(2)(-6)$

$= 1 + 48 = 49$

$\because D > 0 \therefore$ roots are real

$$x = \frac{-b \pm \sqrt{D}}{2a} = \frac{-1 \pm \sqrt{49}}{2(2)} = \frac{-1 \pm 7}{4}$$

$$x = \frac{-1+7}{4} = \frac{6}{4} = \frac{3}{2}$$

$$x = \frac{-1-7}{4} = \frac{-8}{4} = -2$$

$\therefore$ roots are $\frac{3}{2}$ and -2

Q 14. Find two consecutive odd positive integers, sum of whose squares is 290

Solution: Let two consecutive odd positive integers be x and $x+2$

According to the question:

$(x)^2 + (x+2)^2 = 290$

$x^2 + x^2 + 4x + 4 = 290$

$2x^2 + 4x + 4 - 290 = 0$

$2x^2 + 4x - 286 = 0$

$2(x^2 + 2x - 143) = 0$

$\because 2 \neq 0$

$\therefore x^2 + 2x - 143 = 0$

$x^2 + 13x - 11x - 143 = 0$

$x(x-13) - 11(x+13) = 0$

$(x+13)(x-11) = 0$

$x + 13 = 0$ or $x - 11 = 0$

$x = -13$ $\quad x = 11$

$x \neq -13$ rejected(numbers are positive integers)

$\therefore \quad x = 11$

$\therefore$ First number $= 11$

second number $= 11 + 2 = 13$

Q 15. If roots of the quadratic equation $x^2+2x+k=0$ are equal then find the value of k .

Solution: $x^2+2x+k=0$

$ax^2+bx+c=0$

$a=1, b=2, c=k$

$D=b^2-4ac$

$=(2)^2-4(1)(k)$

$=4-4k$

Roots are equal $\therefore b^2-4ac=0$

or $4-4k=0$

or $4=4K$

or $\frac{4}{4}=k$

$\therefore$ $1=k$

$\therefore$value of $k=1$

Q 16. If roots of the quadratic equation $2x^2+kx+3=0$ are equal then find value of k .

Solution: $2x^2+kx+3=0$

$ax^2+bx+c=0$

$a=2, b=k, c=3$

$D=b^2-4ac$

$=(k)^2-4(2)(3)$

$=k^2-24$

$\because$Roots are equal: $\therefore$ $D=0$

$k^2-24=0$

$k^2=24$

$k^2=4\times6$

$k=\pm\sqrt{4\times6}$

$k=\pm2\sqrt{6}$

value of k $=\pm2\sqrt{6}$

Lesson -5

ARITHMETIC PROGRESSIONS

(3 marks question)

Q 1. Fill in the boxes from AP: $-3, 0, 3, 6, 9$ ....

$a_1 = \square$

$a_2 = \square$

$a_3 = \square$

$a_6 = \square$

Answer : $a_1 = -3$, $a_2 = 0$, $a_3 = 3$, $a_6 = 12$

Q 2. For the AP: 1,3,5,7........, write the first term, 5th term and the common difference.

Solution: $a_1 = 1$

$a_5 = 9$

Common difference d = $a_2 - a_1 = 3 - 1 = 2$

Q 3. For AP: 0, 5,10, 15,........ , write the first term, third term and sixth term.

Solution: $a_1 = 0$

$a_3 = 10$

$a_6 = 25$

Q 4. If $a_1 = 10$ and $d = 10$ then write four terms of the AP.

Solution: $a_1 = 10$ $d = 10$

$a_2 = 10 + 10 = 20$

$a_3 = 10 + 20 = 30$

$a_4 = 10 + 30 = 40$

Q 5. Find the missing terms in the following AP.

-4, $\square$, 0, 2, $\square$, 6, $\square$, 10− − − −

Solution: (i) $\square = -2$

(ii) $\square = 4$

(iii) $\square = 8$

Q 6. Write the nth term of AP: $a_1, a_2, a_3, \text{-----} a_n$ if $a_1 = a$ and common difference is d .

Solution: n th term $a_n = a + (n-1)d$ Ans.

Q 7. Write the 10^{th} term of the AP: 2, 4, 6, 8

Solution: $a_1 = 2$, $a_2 = 4$, $a_3 = 6$

$d = a_2 - a_1 = 4 - 2 = 2$

$a_{10} = a + (n-1)d$

$= 2 + (10-1)2$

$= 2 + 9(2)$

$= 2 + 18 = 20$

10^{th} term=20

Q 8. Write the first four term of the A.P. where $a = 4$ and $d = -3$

Solution: $a_1 = 4$,

$d = -3$

$a_1 = 4$

$a_2 = a + d = 4 + 1(-3) = 4 - 3 = 1$

$a_3 = a + 2d = 4 + 2(-3) = 4 - 6 = -2$

$a_4 = a + 3d = 4 + 3(-3) = 4 - 9 = -5$

Answer: Four Terms of A.P = 4,1, -2, -5

(4 marks questions)

Q 9. Which term of the A.P: 3, 8, 13, 18, ... is 78 ?

Solution: $a_1 = 3$, last term $a_n = 78$

$d = 8 - 3 = 5$

$a_n = a + (n-1)\,d$

$78 = 3 + (n-1)5$

$78 = 3 + 5n - 5$

$78 - 3 + 5 = 5n$

$80 = 5n$

$\frac{80}{5} = n$

$16 = n$

78 in the 16^{th} term

Q 10. Find the number of terms in AP: 7, 13, 19.......205 ?

Solution: $a = 7$, $a_n = 205$

$d = 13 - 7 = 6$

$a_n = a + (n-1)d$

$205 = 7 + (n-1)6$

$205 = 7 + 6n - 6$

$205 - 7 + 6 = 6n$

$204 = 6n$

$\frac{204}{6} = n$

$\therefore\ 34 = n$

34 terms in given AP

Q 11. Determine the A.P whose 3^{rd} term is 5 and the 7^{th} term is 9.

Solution: $a_7 = a + 6d = 9$

$a_3 = a + 2d = 5$

Substract $\quad - \quad - \quad -$

$-4d = -4$

$d = \frac{-4}{-4} = 1$

Put value of d in $a+2d=5$

$a+2(1)=5$

$a+2=5$

$a=5-2=3$

$\therefore$ A.P: 3,4,5,6,7.....

Q 12. Find the sum of the first 10 terms of the AP: 2, 4, 6, 8....... 20

Solution: $a=2$

$d=4-2=2$, $n=10$

$Sn=\frac{n}{2}[(2a+(n-1)d]$

$=\frac{10}{2}[2\times2+(10-1)2]$

$=5[4+(9\times2)]$

$=5[4+18]$

$=5\times22=110$

Sum of 10term of AP= 110

Q 13. Find the sum of the first 7 terms of the AP: 10, 20, 30, 40,.......

Solution: $a=10$

$d=20-10=10$

$n=7$

$Sn=\frac{n}{2}[2a+(n-1)d]$

$=\frac{7}{2}[2\times10+(7-1)10]$

$=\frac{7}{2}[20+60]$

$=\frac{7}{2}\times80=40$

$=280$

Sum of the 7 terms of AP=280

Q 14. Write the first 4 terms of A.P: $a_n=1+n$.

Put value $n=1,2,3,4$ in $a_n=1+n$

Solution: $a_1=1+1=2$

$a_2=1+2=3$

$a_3=1+3=4$

$a_4=1+4=5$

First four terms of *a*n AP : 2,3,4,5

Q 15. Write the terms of AP $a_n=5+n$ and 10th term also.

Solution: $a_n=5+n$

Q15. Write the terms of AP $a_n = 5 + n$ and 10th term also.

Solution: $a_n = 5 + n$

Put $n = 1, 2, 3$

$a_1 = 5 + 1 = 6$

$a_2 = 5 + 2 = 7$

$a_3 = 5 + 3 = 8$

$a_{10} = 5 + 10 = 15$

AP: 6,7,8.........

and $a_{10} = 15$ Ans.

Q16. Find the sum of the first 5 multiple of 8

Solution: Multiple of 8 = 8,16,24,32,40 ....

$a = 8$

$d = 16 - 8 = 8$

$n = 5$

$Sn = \frac{n}{2}[2a + (n-1)d]$

$= \frac{5}{2}[2 \times 8 + (5-1)8]$

$= \frac{5}{2}[16 + 4 \times 8]$

$= \frac{5}{2}[16 + 32]$

$= \frac{5}{\not{2}} \times \not{48}$ 24

$= 120$

= Sum of first 5 multiple of 8 =120

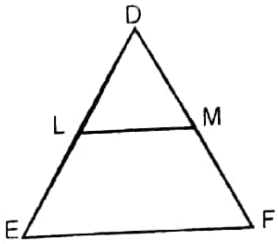
Lesson -6

TRIANGLES

(3 marks questions)

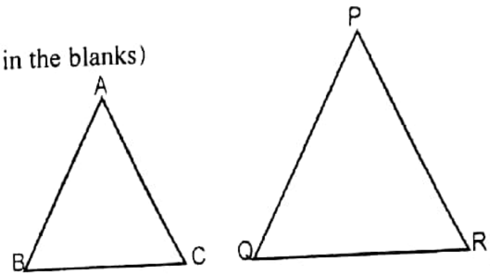
1. Define Thales Theorem
   If a line is drawn parallel to one side of a triangle to intersect the other two rides in distinct.

2. In $\triangle DEF$, $LM \parallel EF$
   Acc. to Thales theorem
   $\frac{DL}{\square} = \frac{\square}{MF}$ (Fill in the blank)



Answer : $\frac{DL}{LE} = \frac{DM}{MF}$

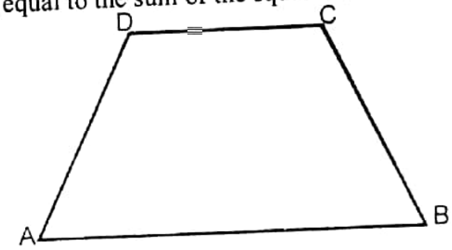
3. $\triangle ABC \sim \triangle PQR$
   then $\frac{ar(\triangle ABC)}{ar(\triangle PQR)} = \frac{AB^2}{\square} = \frac{\square}{QR^2} = \frac{AC}{\square}$ (Fill in the blanks)



Answer: $\frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2}$

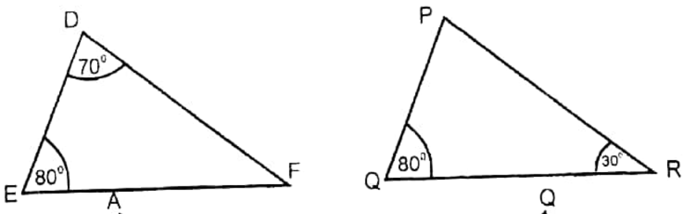
4. Write pythagores theorem
   Answer: In a right triangle, the square of the hypotenuse in equal to the sum of the squares of the other two sides.

5. From the figure,trapezium ABCD write the parallel and non-parallel sides.
   Ans.: parallel sides: AB and DC
   non-parallel sides AD and BC

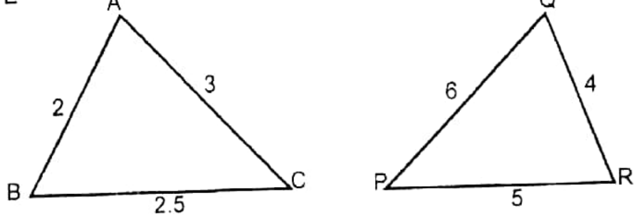


6. Write the following similar triangle in symbolic form

(i)



(ii)

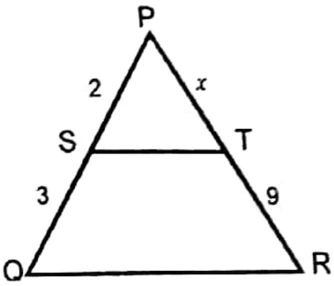


Answer : (i) $\triangle DEF \sim \triangle PQR$

(ii) $\Delta ABC \sim \Delta QRP$

(4 marks question)

7. In figure ΔPQR in which $ST \parallel QR$ find x



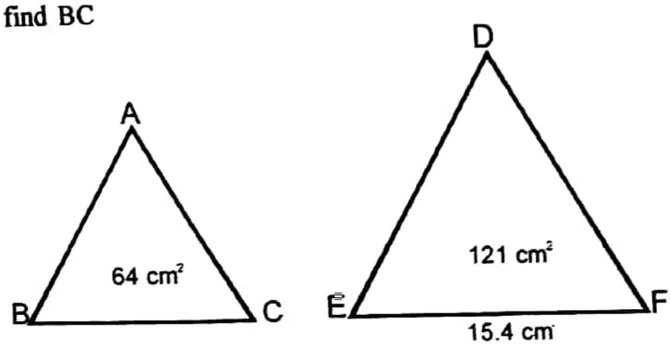
Sol: In ΔPQR, $ST \parallel QR$

$\therefore$ Acc. to Thales theorem

$\frac{PS}{SQ} = \frac{PT}{TR} \Rightarrow \frac{2}{3} = \frac{x}{9}$ or $3x = 2 \times 9$

$x = \frac{2 \times 9}{3} = 6$

8 Let $\Delta ABC \sim \Delta DEP$ and their areas be, respectively, $64\,cm^2$ and $121\,cm^2$ .If $EF = 15.4$ cm them find BC



Sol: $\Delta ABC \sim \Delta DEF$ (given)

$\therefore \frac{ar(\Delta ABC)}{ar(\Delta DEF)} = \frac{AB^2}{DE^2} = \frac{BC^2}{EF^2} = \frac{AC^2}{DF^2}$

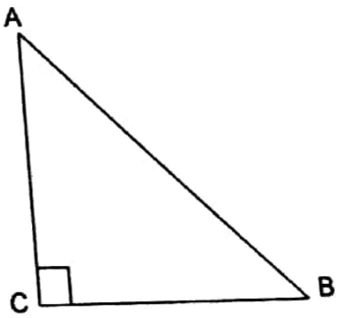
or $\frac{ar(\Delta ABC)}{ar(\Delta DEF)} = \frac{BC^2}{EF^2}$ OR $\frac{64}{121} = \frac{(BC)^2}{(15.4)^2}$

or $\frac{(8)^2}{(11)^2} = \frac{BC^2}{(15.4)^2}$

or $\frac{8}{11} = \frac{BC}{15.4}$

or $BC = \frac{15.4 \times 8}{11} = 11.2cm$

9. ABC is an isosceles triangle right angled at C. Prove that $AB^2 = 2AC^2$



Sol: In ΔABC, $\angle C = 90^0$ and $AC = BC$ (given)

By pythagores Theorem

$AB^2 = AC^2 + BC^2$

$AB^2 = AC^2 + AC^2 (\because BC = AC)$

$\therefore AB^2 = 2AC^2$

10. A ladder $10m$ long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from base of the wall.

Sol: Let length of the ladder $AB = 10m$

ht of window from ground $AC = 8m$

foot of the ladder from base of well$=$ BC

according to pythagorastheorm

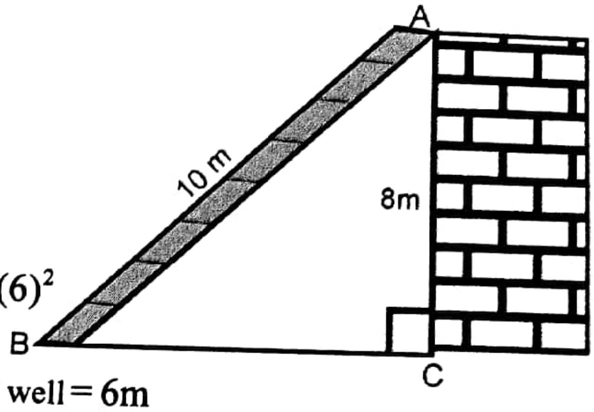
$AB^2 = BC^2 + AC^2$

$(10)^2 = BC^2 + (8)^2$

or $100 = BC^2 + 64 \Rightarrow BC^2 = 100 - 64 = 36 = (6)^2$

$\therefore BC = 6m$

$\therefore$ distance of foot of the ladder from base of the well$= 6m$



11. S and T are points on sides PR and QR of ΔPQR such that $\angle P = \angle RTS$. Show that $\Delta RPQ \sim \Delta RTS$

Sol: In ΔPQR

$\angle P = \angle RTS$ (given)

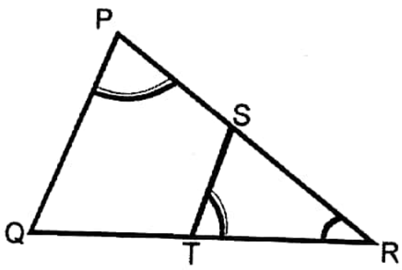
$\therefore$Now in ΔRPQ and ΔRTS

$\angle R = \angle R$ (Common)

$\angle P = \angle RTS$ (given)

$\therefore$ Acc. to AA rule of similarity

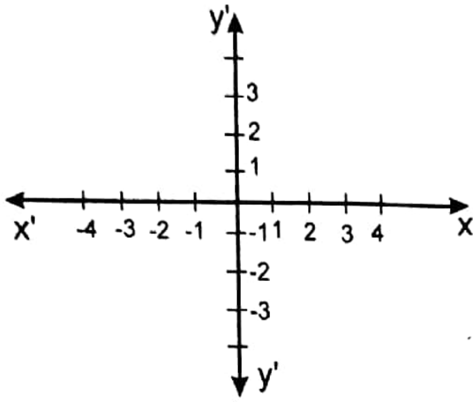
$\Delta RPQ \sim \Delta RTS$



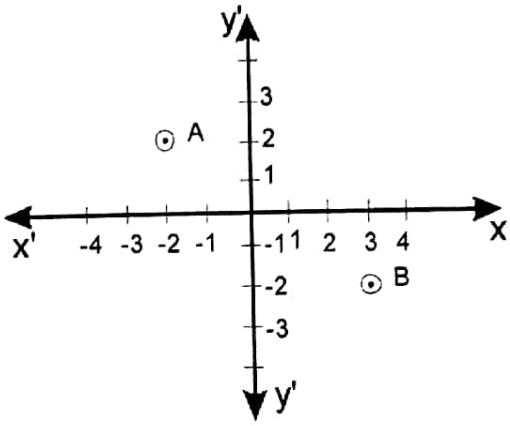
Lesson- 7

(3 marks questions)

1. Plot any point in second and fourth quadrant.

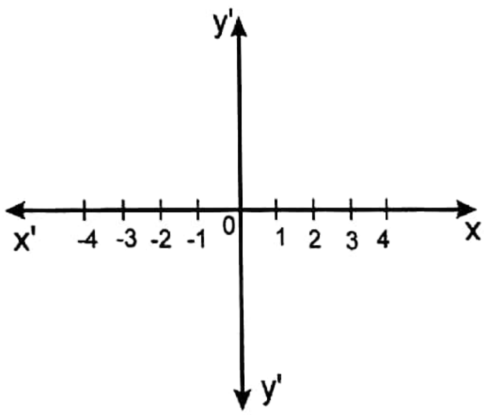


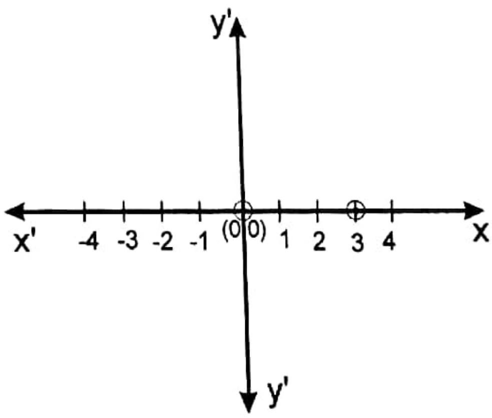
Answer :



A = (-2,2) , B = (3,-2)

2. Plot the point on origin and on $x - axis$





origin $(0,0)$, any point $(3,0)$

3. Find the distance between the points $P(1,2)$ and $Q(3,4)$

Sol. $\overrightarrow{PQ} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(3-1)^2 + (4-2)^2}$

$= \sqrt{(2)^2 + (2)^2}$

$$= \sqrt{4+4} = \sqrt{8} = \sqrt{4\times 2} = 2\sqrt{2}$$

4. Write the formula of the area of the triangle whose vertices are $A(x_1, y_1)$, $B(x_2, y_2)$, and $C(x_3, y_3)$

Ans. Area of the $\Delta ABC = \frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$

5. If a point $X(x, y)$ divides the line segment joining the points $A(x_1, y_1)$ and $B(x_2, y_2)$ in the ration m:n :

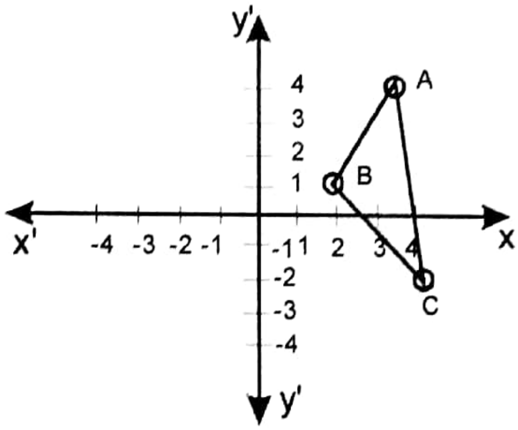
and $x = \frac{mx_2 + nx_1}{m+n}$ then find $y = ?$

Answer: $y = \frac{my_2 + ny_1}{m+n}$

6. Write the formula to find the distance between points $A(x_1, y_1)$ and $B(x_2, y_2)$

Answer: $\overrightarrow{AB} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

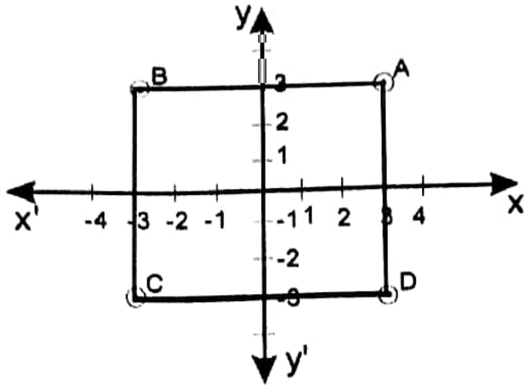
7. Plot three points on a graph paper such that joining the points, it becomes triangle.



Answer: A(3,4) , B(2,1) , C(4,-2)

(4 mark questions)

8. The co-ordinates of a point C (−3,−3) of a square ABCD on the given graph paper, then find the co-ordinates of A ,B and D



Answer: Co-ordinates are A (3,3), B(−3, 3) D (3, −3)

9. Find the abscissa of a point which divides the line segment joining the points A(1,7) and B(5,3) in the ratio 2:3 internally.

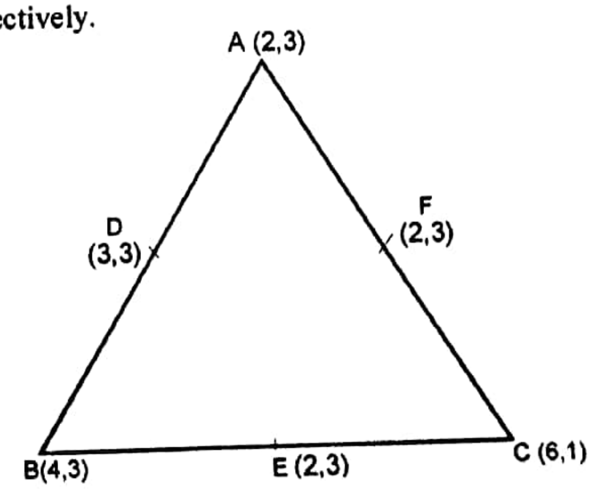
Sol: $x = \frac{mx_2 + nx_1}{m+n}$

$x = \frac{2(5)+3(1)}{2+3}$

$x = \frac{10+3}{5}$

$x = \frac{13}{5}$

10. If a ΔABC whose vertices are A(2,3), B(4,3), C(6,1) then find the co-ordinates of the mid points D, E and F of sides AB,BC and AC respectively.



Sol: Co-ordinate of mid point D of side AB

$x = \frac{x_1 + x_2}{2} = \frac{2+4}{2} = \frac{6}{2} = 3$

$y = \frac{y_1 + y_2}{2} = \frac{3+3}{2} = \frac{6}{2} = 3$

$\therefore D(3,3)$

Co-ordinate of point E, and point of side BC .

$x = \frac{4+6}{2} = \frac{10}{2} = 5$, $y = \frac{3+1}{2} = \frac{4}{2} = 2$

Co-ordinates of point F, the mid point of side AC

$$x = \frac{2+6}{2} = \frac{8}{2} = 4, \quad y = \frac{3+1}{2} = \frac{4}{2} = 2$$

$\therefore F(4,2)$

11. AA². Find the value of k for which the points A(7,2), B(5,1) and C(0, k) are collinear.

Answer: Area of $\Delta ABC = 0$ (The area of triangle is 0 square units when the vertices of the triangle are collinear)

$$= \frac{1}{2}\left(x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right) = 0$$

$$\frac{1}{2}\left(7(1-k) + 5(k-2) + 0(2-1)\right) = 0$$

$\Rightarrow \quad 7 - 7k + 5k - 10 = 0$

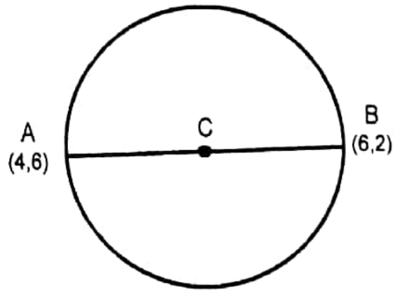
$\Rightarrow \quad -2k - 3 = 0$

$\Rightarrow \quad -2k = 3$

$\Rightarrow \quad k = \frac{3}{-2}$

12. The co-ordinates of the diameter AB of circle are A (4, 6) and B (6,2) then find the co-ordinates of the centre C of the circle.

Answer: $C(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

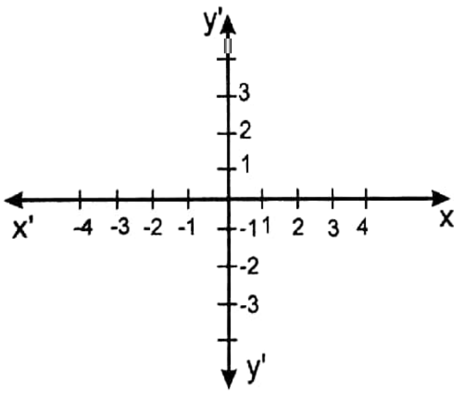


$$= \left(\frac{4+6}{2}, \frac{6+2}{2}\right)$$

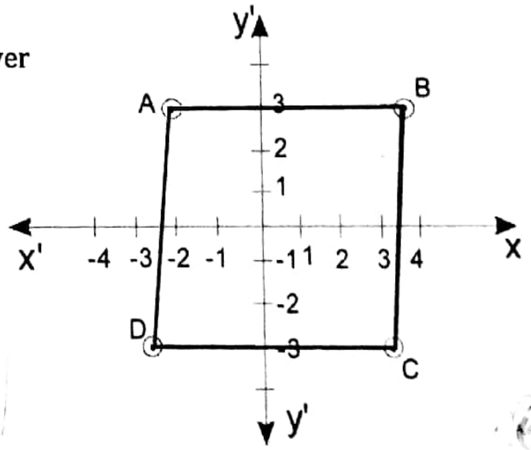
$$\left(\frac{10}{2}, \frac{8}{2}\right) = (5,4)$$

13. Plot the vertices of the parallelogram on the graph paper.

$A(-2,3),\ B(4,3),\ C(3,-3)\ D(-3,-3)$



Answer



Lesson-8

TRIGNOMETRY

(3 marks question)

1. Evaluate $\frac{\tan 65^0}{\cot 25^0}$

Sol: $\frac{\tan 65^0}{\cot 25^0} = \frac{\cot(90^0 - 65^0)}{\cot 25^0} = \frac{\cot 25^0}{\cot 25^0} = 1 \quad \because (\tan A = \cot(90^0 - A)$

2. Evaluate $5 \sin^2\theta + 5\cos^2\theta$

Sol: $5 \sin^2\theta + 5\cos^2\theta$

$= 5 (\sin^2\theta + \cos^2\theta) \quad (\because \sin^2\theta + \cos^2\theta = 1)$

$= 5 \times 1 = 5$

3. Evaluate $2 \tan^2 45^0$

Sol: $2 \tan^2 45^0$

$= 2(1)^2 \quad (\because \tan 45^0 = 1)$

$= 2 \times 1 \times 1 = 2$

4. Evaluate $4 \sin 30^0 \cos 60^0$

Sol: $4 \sin 30^0 \cos 60^0$

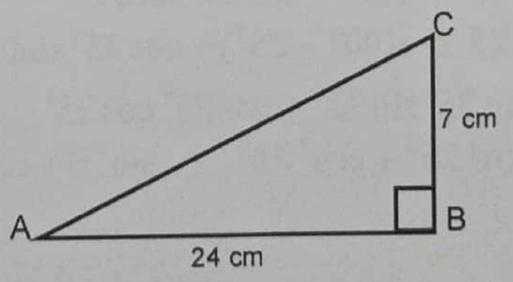
$= 4 \times \frac{1}{2} \times \frac{1}{2} \quad (\because \sin 30^0 = \frac{1}{2}, \cos 60^0 = \frac{1}{2})$

$= 1$

5. In ΔABC, right angled at B, $AB = 24cm, BC = 7cm$. Find the value of $\tan A$

Sol: In ΔABC, $\angle B = 90^0$

$\therefore \tan A = \frac{\text{Base}}{\text{Perpendicular}}$



(4 marks question)

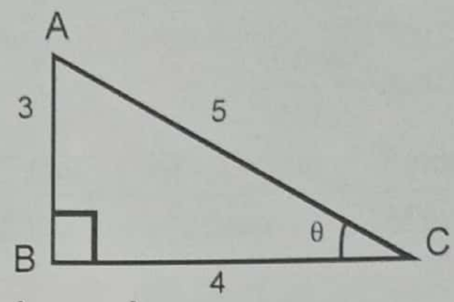
6. Find the value of $\cos\theta$, $\tan\theta$, $\sin\theta$ from the following diagram.

Sol :

$$\cos\theta = \frac{\text{Base}}{\textit{Hypotenuse}} = \frac{BC}{AC} = \frac{4}{5}$$

$$\tan\theta = \frac{\text{Paperdicular}}{\textit{Base}} = \frac{AB}{BC} = \frac{3}{4}$$

$$\sec\theta = \frac{\text{Hypotensue}}{\textit{Base}} = \frac{AC}{BC} = \frac{5}{4}$$



7. Evaluate : $\sin 60^0 \cos 30^0 + \sin 30^0 \cos 60^0$

Sol: $\sin 60^0 \cos 30^0 + \sin 30^0 \cos 60^0$

$$= \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} + \frac{1}{2} \times \frac{1}{2} \quad (\because \sin 60^0 = \cos 30^0 = \frac{\sqrt{3}}{2} \text{ and } \sin 30^0 = \cos 60^0 = \frac{1}{2})$$

$$= \frac{3}{4} + \frac{1}{4}$$

$$= \frac{3+1}{4} = \frac{4}{4} = 1$$

8. Express $\sin 67^0 + \cos 75^0$ in terms of trigonometric ratios of angles between 0^0 and 45^0

Sol: $\sin 67^0 + \cos 75^0$

$$= \sin(90^0 - 23^0) + \cos(90^0 - 15^0) \quad (\because \sin(90^0 - \theta) = \cos\theta \text{ and } \cos\ (90^0 - \theta) = \sin\theta)$$

$$\cos 23^0 + \sin 15^0$$

9. Evaluate: $\sin 25^0 \cos 65^0 + \cos 25^0 \sin 65^0$

Sol: $\sin 25^0 \cos 65^0 + \cos 25^0 \sin 65^0$

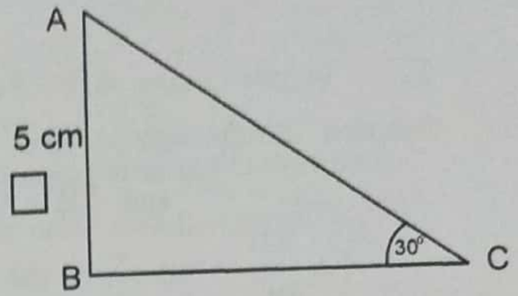
$$\sin 25^0 \cos(90^0 - 25^0) + \cos 25^0 \sin(90^0 - 25^0)$$

$$= \sin 25^0 \sin 25^0 + \cos 25^0 \cos 25^0$$

$$= \sin^2 25^0 + \cos^2 25^0 \quad (\because \sin^2\theta + \cos^2\theta = 1)$$

$$= 1$$

10. In ΔABC, right angled at B, $AB = 5cm$ and $\angle ACB = 30^0$ (see fig.) determine the length of side BC.



Sol: In right angled ΔABC, $\angle B = 90^0$

$\angle ACB = 30^0$ and $AB = 5cm$

$\therefore \frac{AB}{BC} = \tan 30^0$

or $\frac{5}{BC} = \frac{1}{\sqrt{3}}$ $(\because \tan 30^0 = \frac{1}{\sqrt{3}})$

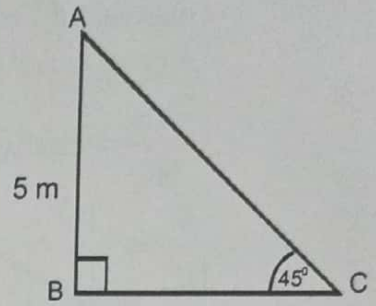
$\therefore BC = 5\sqrt{3}cm$

Lesson-9

SOME APPLICATIONS OF TRIGONOMETRY

(4 marks)

1. In given figure $AB = 5$ m, find BC



Solution: In rightangle ΔABC , $\angle B = 90^0$ and

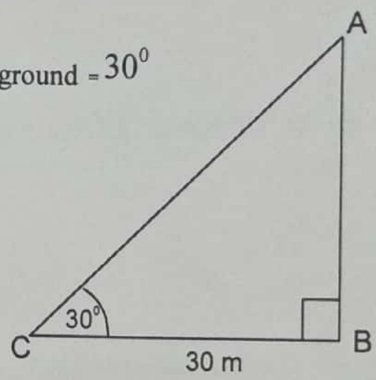
$\angle C = 45^0$ and $AB = 5cm$

$\therefore \frac{AB}{BC} = \tan 45^0$ or $\frac{5}{BC} = 1$ $(\because \tan 45^0 = 1)$

$\therefore BC = 5$ m

2. The angle of elevation of the top of a tower from a point on the ground, which is 30m away from the foot of the tower, is 30^0 Find the height of the tower.

Sol: Let height of tower AB



Angle of elevation of top of the tower from point C on the ground = 30^0

Distance of point C from foot of tower = 30m

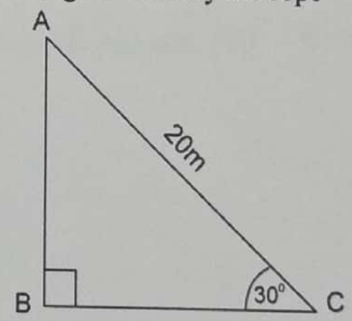
In right angle ΔABC

$\frac{AB}{BC} = \tan 30^0$

or $\frac{AB}{30} = \frac{1}{\sqrt{3}}$ or $AB = 30 \times \frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{30\sqrt{3}}{3} = 10\sqrt{3}$ m

$\therefore$ Height of the tower $= 10\sqrt{3}$ m

3. A circus artist is climbing a 20m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground. Find the height of the pole, if the angled made by the rope with the ground level is 30^0



Sol: Length of the rope $AC = 20m$

Angle of elevation top of pole $\angle C = 30^0$

Height of pole = AB

In rt < ΔABC

$\frac{AB}{AC} = \sin 30^0$ or $\frac{AB}{20} = \frac{1}{2}$ $\because (\sin 30^0 = \frac{1}{2})$

$\therefore AB = \frac{1}{2} \times 20 = 10m$

$\therefore$ Height of pole= 10m

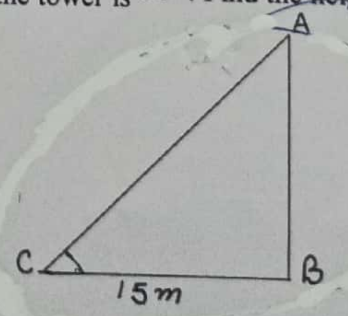
4. A tower stands vertically on the ground.From a point on the ground which is 15m a way from the foot of the tower, the angle of elevation of the top of the tower is 60^0 . Find the height of the tower

Sol: Let AB represent the tower.

is the distance of the point from the tower is CB=15m

angle of elevation $\angle ACB = 60^0$

$\therefore$ In right angled ΔABC



$$\frac{AB}{BC} = \tan 60^0$$

$$\frac{AB}{15} = \sqrt{3} \qquad (\because \tan 60^0 = \sqrt{3})$$

$\therefore AB = 15\sqrt{3}m$ $\quad \therefore$ (height of the tower= $15\sqrt{3}$ m)

5. A kit is flying at height of 60m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 60^0. Find the length of the string, assuming that there is no slack in the string.

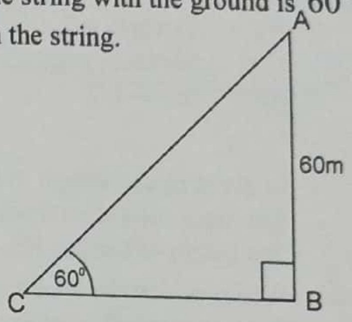
Ô¼ñ : Let AC represents length of the string

AB in the height of kite=60 m

Angle of elevation of the kite= 60^0

$\therefore AB = 60m, \angle ACB = 60^0$

In right angled ΔABC



$$\frac{AC}{AB} = \text{cosec}\, 60^0$$

OR $\frac{AC}{60} = \frac{2}{\sqrt{3}}$ $\qquad (\sin 60^0 = \frac{\sqrt{3}}{2}, \text{cosec}60^0 = \frac{2}{\sqrt{3}})$

OR $AC = 60 \times \frac{2}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{120\sqrt{3}}{3} = 40\sqrt{3}m$

$\therefore$ Length of the string $= 40\sqrt{3}m$

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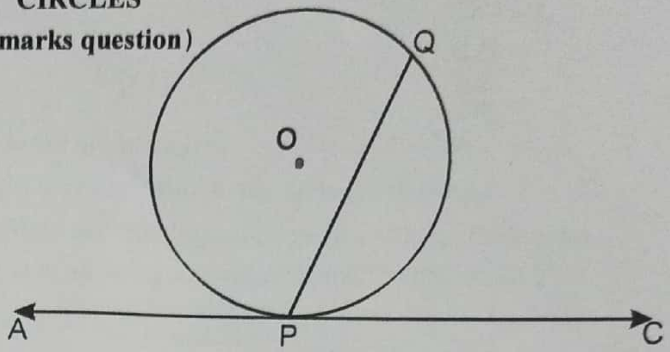
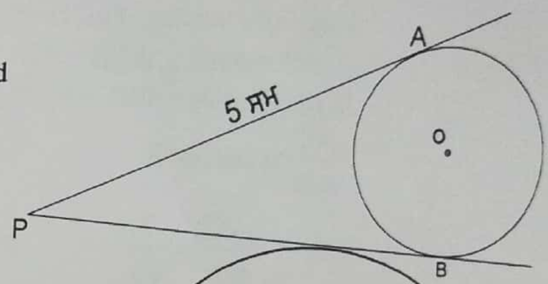
Lesson -10
CIRCLES
(3 marks question)

1. From figure, Write the following:
   (i) Name of the tangent
   (ii) Point of contact
   (iii) Name of the chord



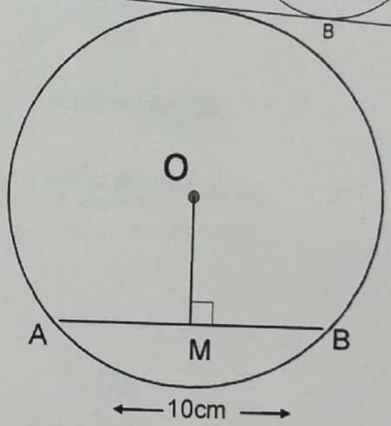
Answer:
   (i) Tangent AC
   (ii) Contanct point P
   (iii) chord PQ

2. In given figure, length of the tangent PA is 5cm from the external point P to circle. Then find the length of tangent PB.



Sol: We know that the length of tangents drawn from an external point to a circle are equal
If PA=5 cm
then PB=5 cm

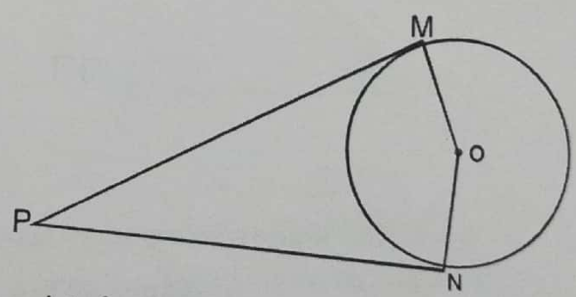
3. In given figure, length of the chord AB is 10 cm and o is centre of the circle. $OM \perp AB$ then find AM



Sol: $AB = 10cm$
$OM \perp AB$
We know that perpendicular from the centre of a circle to the chord, bisect the chord.

$$\therefore AM = \frac{1}{2}AB = \frac{1}{2} \times 10 = 5cm$$

4. In figure, PM and PN are the tangents to the circle with centre O
   (i) Find $\angle OMP$, $\angle ONP$
   (ii) Are $PM = PN$?



Sol : We know that the tangent of the circle is perpendicular to the radius through the point of contact.

$$\therefore \angle OMP = \angle ONP = 90^0$$

(ii) Tangent drawn from an external point to a circle are equal.

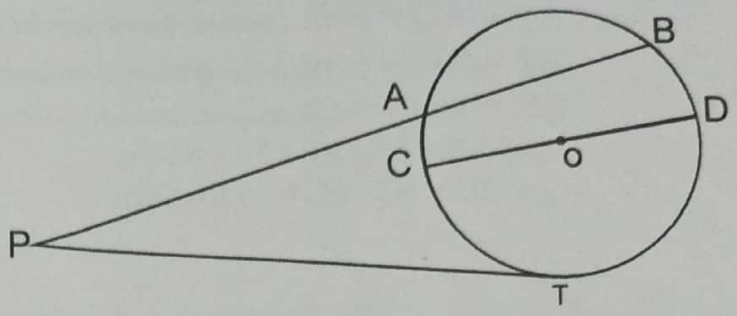
$\therefore PM = PN$

5. Write from the figure:

(i) name of the secant

(ii) diameter

(iii) longest chord



Sol:

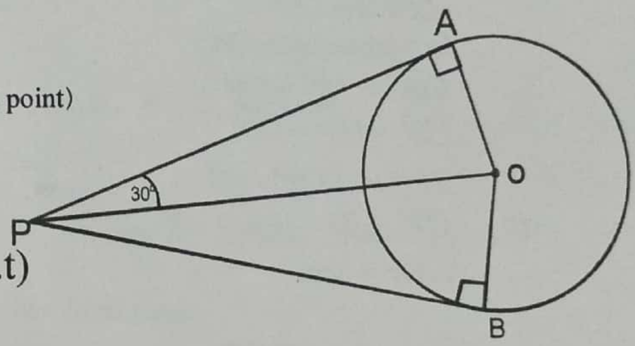
(i) secant PAB

(ii) diameter CD

(iii) longest chord CD

(4 marks questions)

6. From figure find $\angle BPO$



Sol: In ΔPAO and ΔPBO

$\angle OAP = \angle OBP$ (each 90°)

$PA = PB$ (tangent from the external point)

$PO = PO$ (common)

By RHS of congurancy

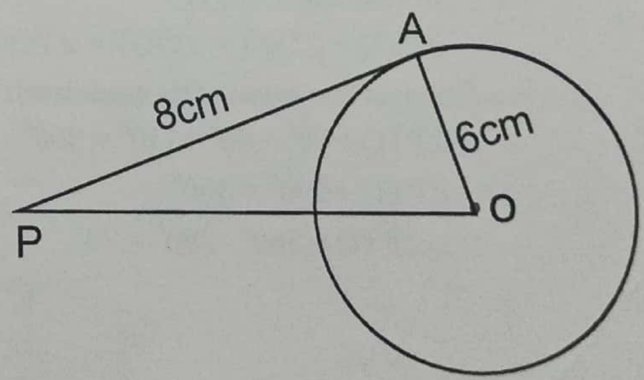
$\Delta PAO \cong \Delta PBO$

$\therefore \angle APO = \angle BPO$ (c.p.c.t)

But $\angle APO = 30^0$ (given)

$\therefore \angle BPO = 30^0$

7. From figure, find OP.



Sol: PA is the tangent, OA is the radius

$\angle PAO = 90^0$

$\therefore$ In right angled ΔPAO

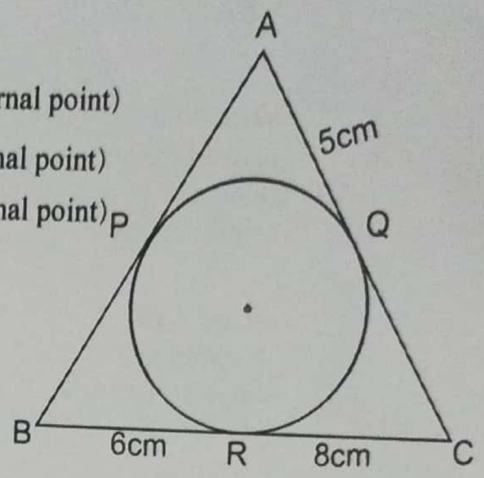
$OP^2 = AP^2 + OA^2$

$OP^2 = (8)^2 + (6)^2$

$OP^2 = 64 + 36 = 100$

$OP^2 = 10^2$ OR $OP = 10cm$

8. From figure, find the lengths of AB and AC



Sol: $AP = AQ = 5cm$ (tangents drawn from the external point)

$BP = BR = 6cm$ (tangents drawn from the external point)

$CR = CQ = 8cm$ (tangents drawn from the external point)

$\therefore$ side $AB = AP + BP = 5 + 6 = 11cm$

side $AC = AQ + QC = 5 + 8 = 13cm$

9. The length of a tangent from a point A at distance 5cm from the centre of the circle is 4 cm. Find the radius of the circle.

Sol: A circle with centre O with radius OP. Tangent AP=4cm.

Distance of point A from centre O is $AO = 5cm$

$\angle APO = 90^0$

In right angled ΔAPO

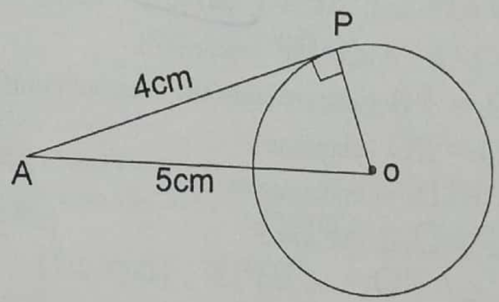
$OA^2 = AP^2 + OP^2$

$(5)^2 = (4)^2 + OP^2$

$25 = 16 + OP^2$

OR $OP^2 = 25 - 16 = 9 = 3^2$

$\therefore OP = 3cm$



10. In figure, if TP, TQ are two tangent in a circle with centre O so that $\angle POQ = 110^0$ then find $\angle PTQ$

Sol: In quadrilatrel OQTP

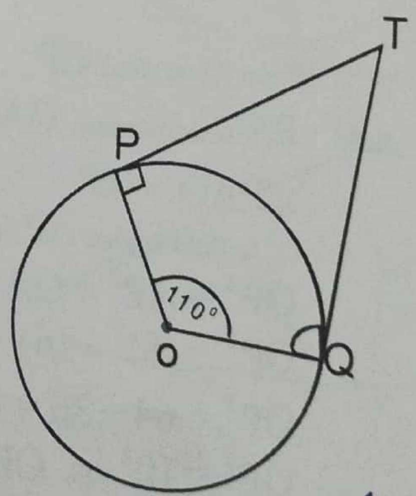
$\angle PTQ + \angle OPT + \angle OQT + \angle POQ = 360^0$

(sum of four angles of the quadrilatrel)

$\angle PTQ + 90^0 + 90^0 + 110^0 = 360^0$

$\angle PTQ + 290^0 = 360^0$

$\therefore \angle PTQ = 360^0 - 290^0 = 70^0$

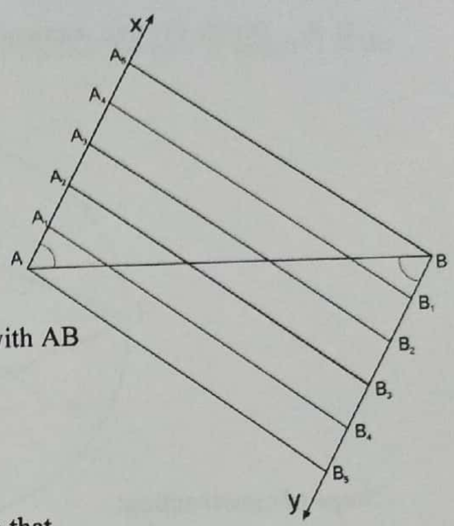


Lesson- 11

CONSTRUCTIONS

(3 marks question)

Q. 1. Draw a line segment of length 10 cm and divide it in 5 equal parts.



Steps of Construction:

1. Take a line segment AB of length 10cm.

2. From point A, draw a ray AX making an acute angle with AB

3. From a point B, draw another ray BY opposite to ray AX, making an acute angle with AB

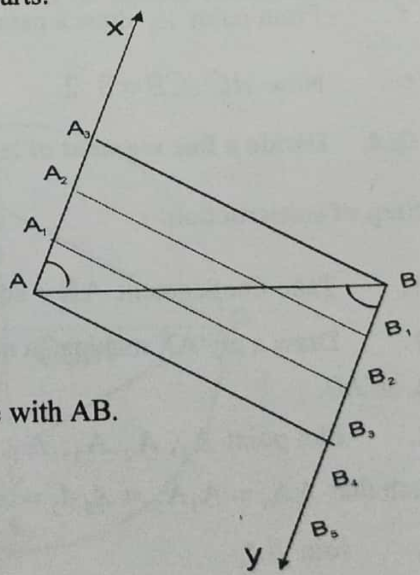
4. Mark the points A_1, A_2, A_3, A_4, A_5 on ray AX such that $AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5$

5. Similarly on ray BY, mark the points B_1, B_2, B_3, B_4, B_5 such that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4 = B_4B_5$

F². Join A with B_5, A_1 with B_4, A_2 with B_3, A_3 with B_2, A_4 with B_1 and A_5 with B Í

7. Therefore line segment AB is divided in five equal parts.

Q.B². Draw a line segment of length 6 cm and divide it in three equal parts.



Steps of Construction:

1. Take a line segment AB of length 6 cm

2. From Point A, draw a ray AX making a acute angle with AB.

3. From point B, draw another ray BY opposite to ray AX making acute angle with AB.

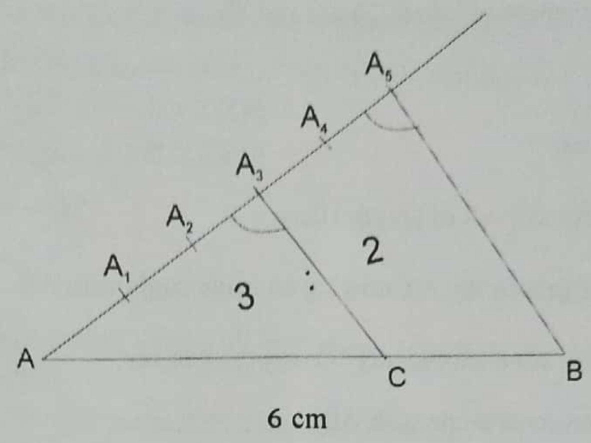
4. Mark the points A_1, A_2, A_3 on ray AX in such a way that $AA_1 = A_1A_2 = A_2A_3$

5. Similarly mark the points B_1, B_2, B_3, on ray BY such that $BB_1 = B_1B_2 = B_2B_3$

F². Join A with B_3, A_1 with B_2, A_2 with B_1, A_3 with B

7. Therefore line segment AB divided in 3 equal part.

Q. 3. Divide the line segment of length 6cm in ratio 3:2



Steps of construction: -

1. Take line segment AB = 6cm

2. Draw a ray AX making an acute angle at A on AB.

3. Take five points A_1, A_2, A_3, A_4, A_5 and A_5 on ray AX such that $AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5$

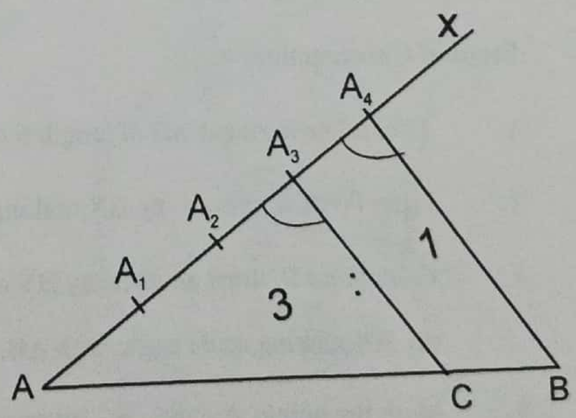
4. Join BA_5

5. From point A_3 draw a parallel line to BA_5 which intersect AB at C

6. Now $AC:CB = 3:2$

Q. 4. Divide a line segment of length 8 cm in ratio 3:1

Step of construction: -



1. Take line segment AB = 8cm

2. Draw a ray AX making an acute angle at A on AB.

3. Plot point $A_1, A_2, A_3, A_4,$ on ray AX such that $AA_1 = A_1A_2 = A_2A_3 = A_3A_4$

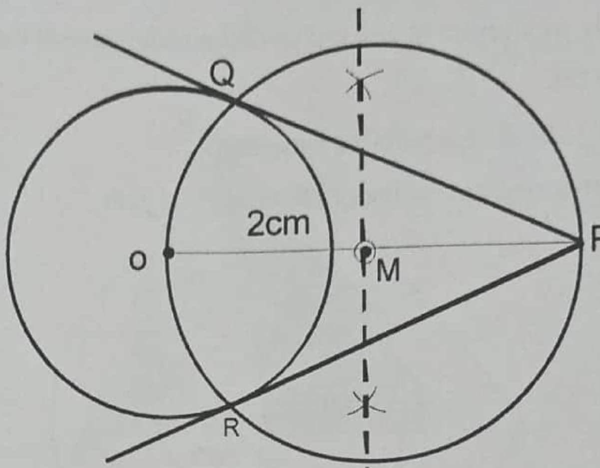
4. Join BA_4

5. From point A_3 draw a parallel line to BA_4 which interested AB at C

6. Now $AC:CB = 3:1$

(4 marks questions)

Q 5. Draw a circle. From a point 5cm away from its centre, construct the pair of tangents to the circle.



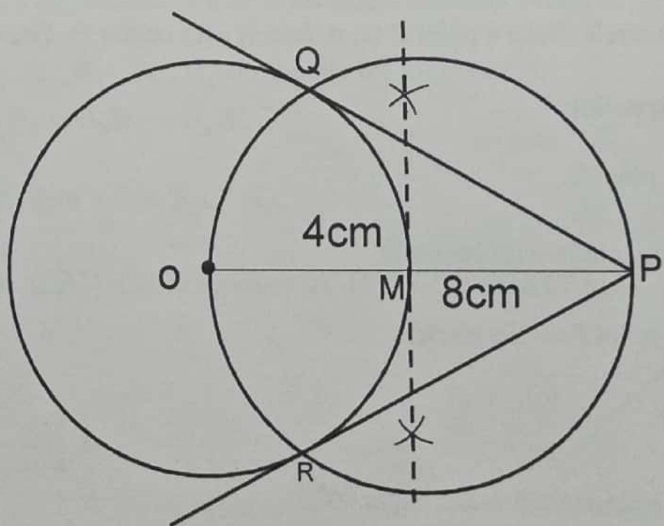
Step of Construction:

1. Draw a circle of radius 2 cm with centre O.
2. Take a point P, 5cm away from its centre.
3. Join PO and bisect it. Let mid point of PO is M.

D. Draw a circle with centre M and radius OM which intersect the given circle at Q and R.

5. Join PQ and PR. These PQ and PR are two tangents.

Q6. Draw a circle of radius 4cm. From a point 8 cm from its centre, construct the pair of tangents to the circle.



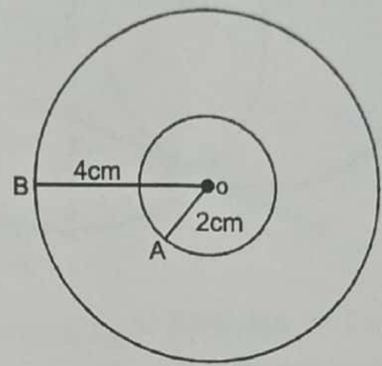
Steps of Construction:

1. Draw a circle of radius 4cm with centre O and take point P away from its centre at distance 8cm.
2. Join OP and bisect it at M.
3. Draw a circle with centre M and radius OM which intersect the given circle at Q and R.

4². Join PQ and PR.

5². Therefore PQ and PR are required tangents.

Q7. Draw two concentric circles with radius 4cm and 2cm

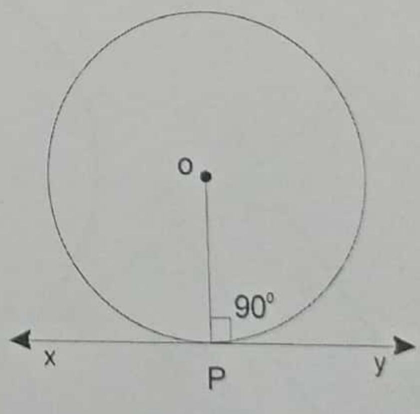


Steps of Construction:

1. Take a point O.
2. Draw a circle of radius 2 cm taking centre O.
3. Draw another circle on centre O with radius 4cm.
4. Those circles whose centres are at the same point called concentric circles.

Q8. Draw a circle. Take a point P on it. Join it with centre O. Draw tagent at point P.

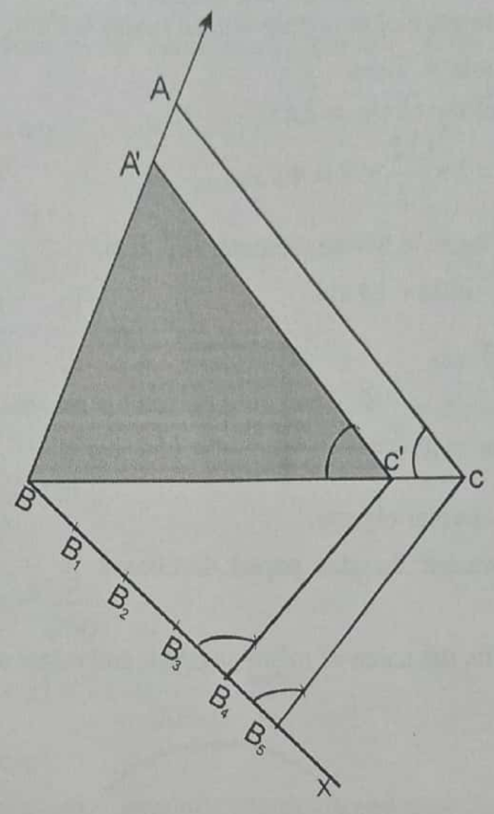
Steps of construction:



1. Take a point O.
2. Draw any circle with centre O.
3. Take a point P on the circle.
4. Join OP.
5. on line segment OP make angle 90^0

   at point P
6. Draw line XPY
7. So, XPY is a tangent to the circle at point P.

Q 9. Take a triangle. Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{4}{5}$ of the corresponding sides of the triangle ABC



1. Take a triangle ΔABC

2. From Point B draw a ray BX making an acute angle opposite vertex A.

3. Locate 5 points B_1, B_2, B_3, B_4, B_5 on the ray BX such that
   $BB_1 = B_1B_2 = B_2B_3 = B_3B_4 = B_4B_5$

4. Join B_5 with C and Draw a line B_4C' B_5C .

5. From C draw a line $C'A' || CA$. Therefore $A'BC'$ is required triangle.

Lesson-12

AREAS RELATED TO CIRCLES

(3 Marks Question)

1. Find the circumference of the circle whose radius is 7cm.

Sol : Radius of the circle $= 7$ cm

Circumference of the circle $= 2\pi r$

$$= 2 \times \frac{22}{7} \times 7 = 44 \text{ cm}$$

2. Find the area of a circle whose diameter is 14cm.

Sol : Diameter of the circle = 14 cm

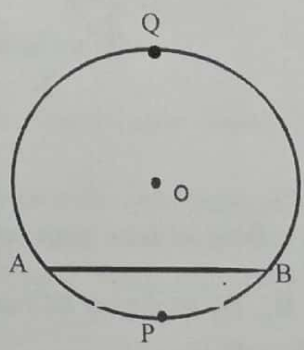
radius $= \frac{14}{2} = 7$ cm

area of the circle $= \pi r^2 = \frac{22 \times 7 \times 7}{7} = 154 \text{ cm}^2$

3. Write any four circular objects.

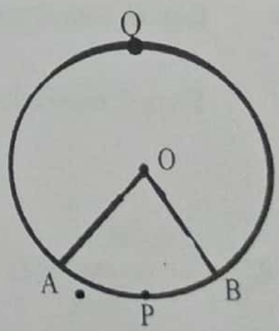
Sol: Cycle wheels, washer, bangles, papad, dart board

4. From figure write the name of major segment and minor segment.



Sol: Major Segment: AQB
Minor segment: APB

5. In figure, write the name of minor sector and major sector.



Answer: (major sector): OAQB
(minor sector) : OAPB

6. Find radius of the circle whose circumference is 22cm

Answer: Circumference of the circle= 22 cm

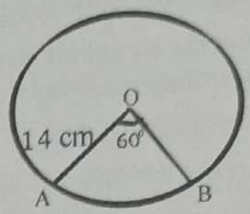
$$2\pi r = 22$$

$$2 \times \frac{22}{7} \times r = 22$$

$$\therefore r = \frac{22 \times 7}{2 \times 22} = \frac{7}{2} \text{ cm} = 3.5 \text{ cm}$$

(4 marks questions)

8. In a circle of radius 14cm, an arc subtends an angle 60^0 at the centre. Find the length of the arc



Sol: radius of the circle=14 cm

Central angle $\theta = 60^0$

Length of arc $= 2\pi r \frac{\theta}{360}$

$$= 2 \times \frac{22}{7} \times 14 \times \frac{60}{360} = \frac{44}{3} \text{cm}$$

9. In a circle of radius 21cm, an arc subtends an angle 60^0 at the centre. Find the area of the sector formed by the arc.

Sol: radius of the circle $= 21$cm

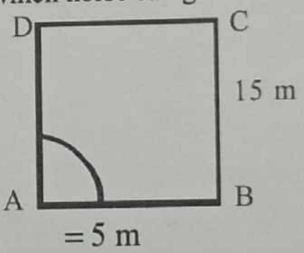
Central angel $\theta = 60^0$

Area of the sector $= \pi r^2 \frac{\theta}{360}$

$$= \frac{22}{7} \times 21 \times 21 \times \frac{60}{360}$$

$$= 231 \text{cm}^2$$

10. A horse is tied to a peg at one corner of a square shaped grass field of side 15m by means of a 5m long rope. Find the area of that part of the field in which horse can graze.



Sol. Side of the square $= 15$ m

Length of the rope $= 5$ m

Each angle of square $= 90^0$

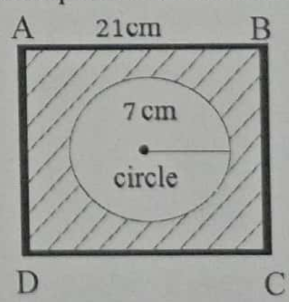
Area of that part of the field in which

Horse can graze $= \pi r^2 \frac{\theta}{360}$

$$= 3.14 \times 5 \times 5 \times \frac{90}{360} = \frac{39.25}{2}$$

$$= 19.625 \text{m}^2$$

11. A square whose side is 21cm. A circle of radius 7cm is drawn in the square. Find the area of the remaining part of the square.



Sol: side of the square= 21cm

Area of the square =(side)^2

$= (21)^2 = 21 \times 21 = 441 \text{cm}^2$

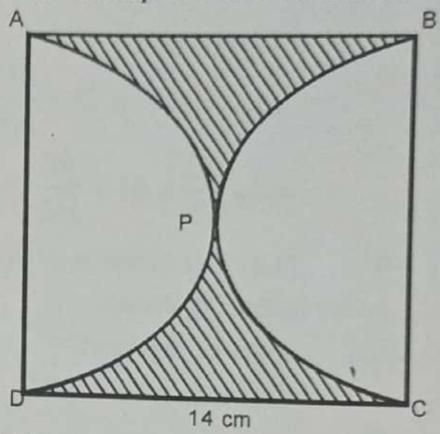
radius of the circle=7 cm

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

$$= \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$$

Area of the remaining part of square $= 441 - 154 = 287 \text{ cm}^2$

12. Find the area of the shaded region in given figure, If ABCD is a square of side 14cm and APD and BPC are semicircles.



Sol: side of square ABCD =14 cm

Area of the square= side^2

$= 14^2 = 196 \text{ cm}^2$

Diameter of semicircle APD =14cm

radius$= \frac{14}{2} = 7$ cm

area of one semi circle $= \frac{1}{2}\pi r^2 = \frac{1}{2} \times \frac{22}{7} \times 7 \times 7 = 77 \text{ cm}^2$

area of two semi circle$= 77 + 77 = 154 \text{ cm}^2$

area of remaining shaded part $= 196 - 154 = 42 \text{ cm}^2$

Lesson-13

SURFACE AREAS AND VOLUMES

(3 marks questions)

1. Write three examples of cuboid from daily life.

Ans: (i) Match box (ii) chalk box (iii) book

2. Write the formula of volume of a frustum of a cone.

Ans: $\frac{1}{3}\pi h\,(r_1^2 + r_2^2 + r_1 r_2)$

3. The diameter of a sphere is 4cm then find its radius.

Ans: radius $= \frac{Diameter}{2}$

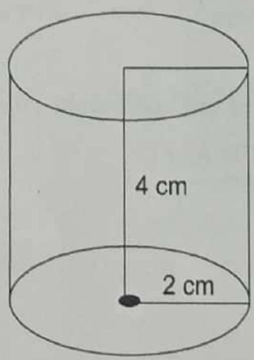
$= \frac{4}{2}$

$= 2$ cm

4. Fill in the blanks from figure:

(i) r = ______

(ii) h = ______



Ans: (i) r = 2cm

(ii) h = 4cm

5. Match the following:

(a) Match box (i) Sphere

(b) cap of a Turks (ii) cuboid

(c) Footbal (iii) cube

(d) dice (iv) cone

Sol: (a) ⟶ (ii), (b) ⟶ (iv), (c) ⟶ (i), (d) ⟶ (iii)

6. What is the relation between slant height of a cone, its radius and height.

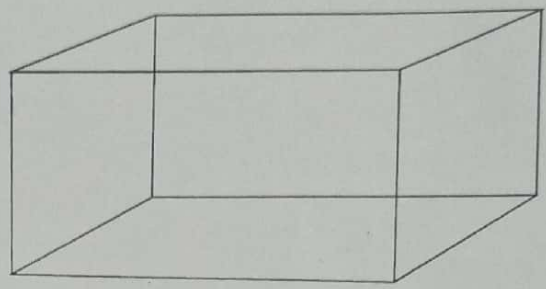
Sol: Slant height $= \ell$

radius $= r$

height $= h$

$$\ell^2 = h^2 + r^2 \Rightarrow \ell = \sqrt{h^2 + r^2}$$

7. Draw a diagram of a cuboid. Count its faces and edges.



Sol: Faces $= 6$
edges $= 12$

(4 marks questions)

8. A cube has a edge 4cm. Find its total surface area.

Sol: side of a cube $= a = 4\text{cm}$

Total surface area of a cube $= 6a^2$

$= 6 \times 4 \times 4 = 96\text{cm}^2$

9. A cylinder whose diameter is 14 cm and height 10 cm. Find volume.

Sol: diameter of the cylinder $= 14\text{cm}$

radius $r = \frac{14}{2} = 7\text{cm}$

height $h = 10\text{cm}$

volume $= \pi r^2 h$

$= \frac{22}{7} \times 7 \times 7 \times 10$

$= 1540\text{cm}^3$

10. Find the volume of a cube whose height is 21cm and radius of its base is 6cm.

Sol: height of the cube $= 21\text{cm}$

Radius of the base of cone $(r) = 6\ cm$

Volume of cube $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times 6 \times 6 \times 21$

$= 792\text{cm}^3$

11. The radius of a hemisphere 14cm. Find its curved surface area.

Sol: radius of the hemisphere $r = 14\text{ cm}$

Curved surface of the hemisphere $= 2\pi r^2$

$$= 2 \times \frac{22}{7} \times 14 \times 14$$

$$= 1232 \text{ cm}^2$$

12. Volume of a cube is 64cm^3. Find its each side.

Sol: Volume of a cube $= (\text{side})^3$

$(\text{side})^3 = 64\text{cm}^3$

$(\text{side})^3 = (4)^3$

$\therefore$ side $= 4\text{cm}$

13. Find the volume of a cuboid whose dimensions are $5\text{cm} \times 10\text{cm} \times 4\text{cm}$.

Sol: volume of cuboid $= \ell \times b \times h$

$$= 5 \times 10 \times 4$$

$$= 200\text{cm}^3$$

14. How much milk can be poured in the hemispherical bowl whose radius is 7cm

Sol: radius of a hemispherical bowl=7cm

volume of a hemispherical bowl $= \frac{2}{3}\pi r^3$

$$= \frac{2}{3} \times 7 \times 7 \times 7$$

$$= \frac{2156}{3}\text{cm}^3 \text{ or } = 718.67\text{cm}^3$$

Lesson-14

STATISTICS

(3 marks question)

1. Write the upper and lower limit of a class interval 100−150

Upper limit = 150

Lower limit = 100

2. Write the class mark of the class interval 10-30

Sol:

Class mark = $\frac{\textit{upper class limit}+\textit{lower class limit}}{2}$

$= \frac{10+30}{2}$

$= \frac{40}{2} = 20$

3. Find the mean of the data 2, 9, 7, 8, 14.

Sol: mean = $\frac{\textit{sum of the observations}}{\textit{number of observation}}$

$= \frac{2+9+7+8+14}{5}$

$= \frac{40}{5} = 8$

4. Find the mean of the first five natural numbers.

Sol: First five natural numbers $= 1, 2, 3, 4, 5$

mean $= \frac{1+2+3+4+5}{5}$

$= \frac{15}{5} = 3$

5. Write names of three methods to find mean.

Ans: (i) direct method

(ii) assumed mean method

(iii) step deviation method

6. What is the class size of the class interval 60-100?

Sol: class size = upper class limit − lower class limit

$= 100 - 60 = 40$

7. median $= \ell + \left(\frac{\frac{n}{2} - cf}{f}\right) \times h$, what is the meaning of ℓ and f

Sol: $\ell =$ lower limit of median class.

f = frequency of median class.

8. Find the median of the data 6, 7, 9, 5, 4, 8, 7, 3, 2.

Sol: ascending order- 2,3,4,5,6,7,7,8,9

Number of observation =9 and 9 is a odd number.

$\therefore$ Median $= (\frac{n+1}{2})^{th}$ observation.

$= \frac{9+1}{2} = \frac{10}{2} = 5^{th}$ observation

Median = 5^{th} observation means F

(4 marks question)

9. Following given data represents the number of plants in 20 houses. Find the mean number of plants per house.

Number of plants	0-2	2-4	4-6	6-8	8-10	10-12	12-14
Number of houses	1	2	1	5	6	2	3

Sol:

Number of plants	Number of houses f_i	Class mark x_i	$f_i x_i$
0-2	1	1	1
2-4	2	3	6
4-6	1	5	5
6-8	5	7	35
8-10	6	9	54
10-12	2	11	22
12-14	3	13	39
	$\Sigma fi = 20$		$\Sigma fi\ xi = 162$

From above data

Mean $\bar{x} = \frac{\Sigma f_i x_i}{\Sigma f_i}$

$= \frac{162}{20} = 8.1$

10. The marks obtained by 20 students of class X of a certain school in Science paper consisting of 100 marks are presented in table below. Find the mean marks.

Marks obtained x_i	10	20	36	40	50
Number of students f_i	4	3	5	6	2

Sol:-

Marks obtained x_i	Number of students f_i	$f_i x_i$
10	4	40
20	3	60
36	5	180
40	6	240
50	2	100
	$\Sigma f_i = 20$	$\Sigma f_i x_i = 620$

$$\text{Mean } \overline{X} = \frac{\Sigma f_i x_i}{\Sigma f_i}$$
$$= \frac{620}{20}$$
$$= 31$$

11. Marks obtained by 80 students of a class given below. Find the mode of the data.

Marks obtained	0-10	10-20	20-30	30-40	40-50
No. Of students	6	10	12	32	20

Sol: In given data maximum number of students (frequency) are 32 and they lies in the class interval 30-40.

$\therefore$ Model class 30-40

$$\therefore \ell = 30; f_1 = 32; f_0 = 12; f_2 = 20; h = 10$$

$$\text{Mode } = \ell + \left(\frac{f_i - f_0}{2f_1 - f_0 - f_2}\right) \times h$$

$$= 30 + \left(\frac{32 - 12}{2(32) - 12 - 20}\right) \times 10$$

$$= 30 + \left(\frac{20}{64 - 32}\right) \times 10$$

$$= 30 + \frac{200}{32}$$

$$= 30 + 6.25 = 36.25$$

12. The following table gives production yield per hectare of wheat of 100 farms of a village.

Production yield (in kg/ha)	50-55	55-60	60-65	65-70	70-75	75-80
Number of farms	2	8	12	24	38	16

Change the distribution to a more than type distribution.

sol :

Production	Cumulative frequency
More than or equal to 50	100
More than or equal to 55	98
More than or equal to 60	90
More than or equal to 65	78
More than or equal to 70	54
More than or equal to 75	16

13. The following distribution gives the daily income of 50 workers of a factory.

Daily income in (₹)	100-120	120-140	140-160	160-180	180-200
Number of workers	12	8	14	6	10

Convert the above distribution to a less than type cumulative frequency distribution.

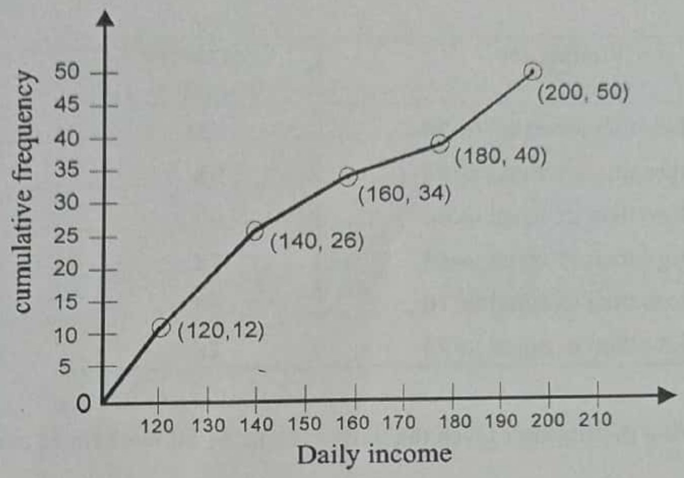
Sol:

Daily income in (₹)	Cumulative frequency
less than 120	12
less than 140	12+8 = 20
less than 160	20+14 =34
less than 180	34+6 =40
less than 200	40+10 =50

14. Draw Ogive of the following table.

Daily income	less than 120	less than 140	less than 160	less than 180	less than 200
Number of worker(cumulative)	12	26	34	40	50

Sol :



15. Find the median of the following data.

Marks obtained	20	29	28	33	42	38	43	25
Number of students	6	28	24	15	2	4	1	20

Sol: –First we arrange the marks in ascending order and prepare a cumulative frequency table.

Marks obtained	Number of students frequency (f)	Cumulative frequency cf
20	6	6
25	20	6+ 20 =26
28	24	26+ 24 =50
29	28	26+ 24 =78
33	15	78+ 15 =93
38	4	93+ 4 =97
42	2	97+ 2 =99
43	1	99+ 1 =100
Total	100	

Here n=100 which is even. Then median will be the average of the $\frac{n}{2}^{th}$ and $\left(\frac{n}{2}+1\right)^{th}$ observation ie., average of the 50^{th} and 51^{th} observation.

50^{th} observation is $= 28$

51^{th} observation is $= 29$

$$\text{Median}=\frac{28+29}{2}=\frac{57}{2}=28.5$$

Lesson-15
PROBABILITY
(3 marks question)

1. Write formula of probability

$P(E) = \frac{Number\ of\ favourable\ outcomes}{Total\ number\ of\ outcomes}$

2. A box contains 5 red and 3 green marbles. If a marbles is drawn at random from the box. What is the probability of getting of red marble.

Sol: Let E be the probability of red marbles.

Number of possible outcomes$= 5+3=8$

$P(E) = \frac{Number\ of\ favourable\ outcomes}{Total\ number\ of\ outcomes}$

$=\frac{5}{8}$

3. What is the probability of getting a head when a coin is tossed once.

Sol: Total outcomes$= 2$

$P\ (head) = \frac{1}{2}$

4. If $P(E)=0.05$, What is the probability of 'not E'?

Sol: $P(E)+P(\overline{E})=1$

$P(\overline{E})=1-P(E)$

$=1-0.05=0.95$

5. A dice is thrown once, what is the probability of getting a number greater than 4

Sol: Total outcomes $=6$

outcomes greater than 4 $= 2$

$P(greater\ than\ 4) = \frac{2}{6} = \frac{1}{3}$

(4 marks questions)

6. A bag contains 8 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is red?

Sol: Total outcomes $=8+5=13$

number of red balls$=8$

$P(red\ ball) = \frac{8}{13}$

7. A box contains 3 blue, 2 white and 4 red marbles. If a marbles is drawn at random from the box what is the probability that it will be white marble.

Sol: Total outcomes $=3+2+4=9$

number of white marbles$= 2$

$P\ (white) = \frac{2}{9}$

8. A dice is thrown once.Find the probability of getting a number lying between 2 and 6

Sol: Total outcomes of dice $=6$

numbers between 2 and 6 $=(3,4,5)=3$

$$P(\text{between 2 and 6}) = \frac{3}{6} = \frac{1}{2}$$

9. A dice is thrown once. Find the probability of getting an odd number.

Sol: Total outcomes of a dice $=6$

odd number $=(1,3,5)=3$

$$P\ (\text{odd number}) = \frac{3}{6} = \frac{1}{2}$$

10. Write the total outcomes when a dice is thrown once.

Sol: Total possible outcomes $=1,2,3,4,5,6=6$

11. A child has a die whose six faces show the letters as given below:

A	B	C	E	D	E

The die is thrown once. What is the probability of getting E

Sol: Total outcomes $=6$

Number of E $=2$

$$P(E) = \frac{2}{6} = \frac{1}{3}$$

12. When we tossed a coin, the probability of head is greater than tail, less than tail or equal?

Answer: When we tossed a coin, the probability to get head and tail are equal.