Lesson-1

(3 marks question)

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

Solution: $20 = 6 \times 3 + 2$

$6 = 2 \times 3 + 0$

remainder = 0 and divisor = 2

HCF=2

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

Solution: $135 = 65 \times 2 + 5$

$65 = 5 \times 13 + 0$

remainder = 0 and divisor = 5

HCF (65,135) = 5

Q.3 Express 20 as prime factors.

Solution: $20 = 2 \times 2 \times 5$

$= 2^2 \times 5^1$

2	20
2	10
5	5
	1

Q.4 Express 156 as prime factors.

Solution: $156 = 2 \times 2 \times 3 \times 13$

$= 2^2 \times 3^1 \times 13^1$

2	156
2	78
3	39
	13

Q.5 Find the LCM of 18 and 12 .

Solution: $18 = 2 \times 3 \times 3$

$= 2^1 \times 3^2$

$12 = 2 \times 2 \times 3$

$= 2^2 \times 3^1$

2	18
3	9
3	3
	1

2	12
2	6
3	3
	1

LCM = Product of the greatest power of each prime factor.

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

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

Solution:

$$\frac{30}{8} = \frac{2^1 \times 3^1 \times 5^1}{2 \times 2 \times 2} = \frac{2^1 \times 3^1 \times 5^1}{2^3} \times \frac{5^3}{5^3} = \frac{2^1 \times 3^1 \times 5^1 \times 5^3}{2^3 \times 5^3}$$

$$= \frac{2 \times 3 \times 5 \times 5 \times 5 \times 5}{10 \times 10 \times 10} = \frac{2 \times 3 \times 5 \times 5^3}{10^3} = \frac{3750}{1000} = 3.75$$

2	8
2	4
2	2
	1

Q.7 Express **0.75** as rational number.

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

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 question)

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

Solution: $8 = 2\times2\times2 = 2^3$

$9 = 3\times3 = 3^2$

$25 = 5\times5 = 5^2$

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

LCM = $2^3\times 3^2\times5^2 = 8\times 9 \times 25 = 1800$

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

Solution: $15 = 3\times5 = 3^1\times5^1$

$12 = 2\times2\times3 = 2^2\times3^1$

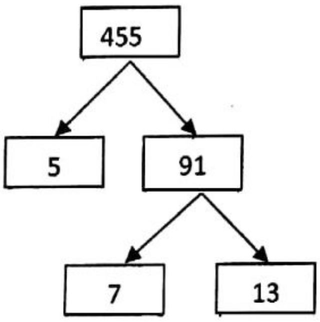
$21 = 3\times7 = 3^1\times7^1$

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

HCF = $3^1 = 3$ Ans.

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

Solution:

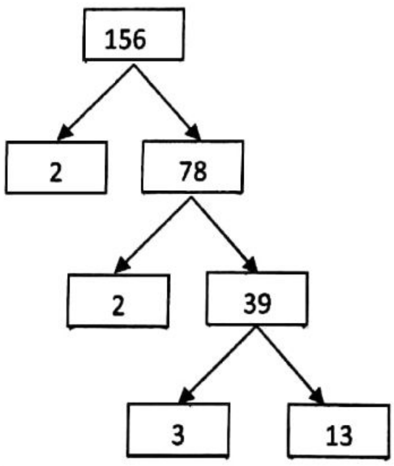


5	455
7	91
13	13
	1

$455 = 5\times 7\times 13$

Q.12 Express 156 as a product of prime factor (By using factor tree method).

Solution:



2	156
2	78
3	39
13	13
	1

$156 = 2\times2\times3\times13$

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

Solution: HCF × LCM = First number × Second number

$13 \times \text{LCM} = 26 \times 91$

$$LCM = \frac{26 \times 91}{13} = 182$$

LCM = 182

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

Solution: HCF × LCM = First number × Second number

$$5 \times LCM = 15 \times 25$$

$$LCM = \frac{15 \times 25}{5} = 75$$

LCM = 75

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

Solution: $6 = 2 \times 3 = 2^1 \times 3^1$

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

$120 = 2 \times 2 \times 2 \times 3 \times 5 = 2^3 \times 3^1 \times 5^1$

$LCM = 2^3 \times 3^2 \times 5^1 = 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 360$

LCM = 360

2	72
2	36
2	18
3	9
3	3
	1

2	120
2	60
2	30
3	15
5	5
	1

Q.16 Explain why $7 \times 11 \times 13 + 13$ is composite number.

Solution: $7 \times 11 \times 13 + 13 = 13 (7 \times 11 + 1)$

$= 13 (77 + 1)$

$= 13 \times 78$

$= 13 \times 13 \times 3 \times 2$

2	78
3	39
13	13
	1

It is product of prime numbers.

∴ $7 \times 11 \times 13 + 13$, is composite number

Lesson-2

(3 marks questions)

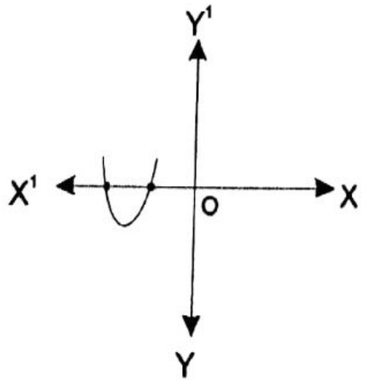
Q.1 Write the formula of sum and product of zeroes of quadratic polynomial $ax^2 + bx + c$ whose zeros are α and β .

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

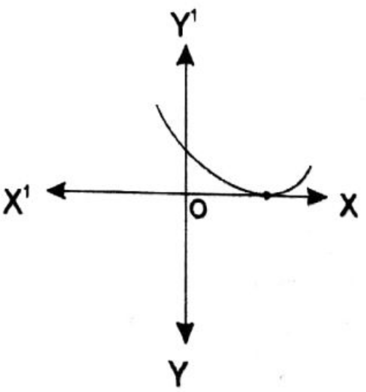
$$\alpha\beta = \frac{c}{a} = \frac{(constant\ term)}{coefficient\ of\ x^2}$$

Q.2 Given below the graph of $y = p(x)$, Where $p(x)$ is a polynomial. Find the number of zeros 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 points only.

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

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: [illegible]

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

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

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

So the value of $x^2 - 2x - 8$ is zero when

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

$x = 4$ or $x = -2$

The zeroes of quadratic polynomial $x^2 - 2x - 8$ are 4 and -2 .

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

Solution:

x-1) x^2-2x-3 (x-1

x^2 - x

\- +

\- x -3

\- x+1

\+ -

-4 remainder

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 $x=2$

zeroes are -2 and 2.

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

Solution:

$x+2 \overline{)\,2x^2+3x+1\,(}\ 2x-1$

$2x^2+4x$

$-\quad -$

$-x+1$

$-x-2$

$+\quad +$

3 remainder

Quotient $=2x-1$ and remainder $=3$

(4 marks Question)

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

Solution:

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

$x^3 \qquad -2x$

$-\quad +$

$-3x^2+7x-3$

$-3x^2 \qquad +6$

$+\qquad -$

$7x-9$ remainder

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.

$$\therefore \alpha+\beta=-3=\frac{-b}{a}$$

$$\alpha.\beta=2=\frac{c}{a} \qquad \Rightarrow \qquad \text{If } a=1 \text{ then } b=3 \text{ and } c=2$$

$\therefore$Quadratic polynomial. $=ax^2+bx+c=x^2+3x+2$

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 zeros are 1 and -1 respectively.

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

$\therefore\ \alpha+\beta=\frac{-b}{a}=1$

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

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

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

Solution: Sum of zeroes $= \alpha+\beta = \frac{-(coefficient\ of\ x)}{(coefficient\ of\ x^2)} = \frac{-7}{1}$

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

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

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

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

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

The value of $6x^2-7x-3$ is zero when

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

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

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

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

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

$\therefore$ Product of zeroes $= \alpha.\beta=\frac{3}{2}\times\frac{-1}{3}=\frac{-1}{2}$

also Product of zeroes $=\frac{c}{a}=\frac{-3}{6}=-\frac{1}{2}$

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 polynomials of degree 2 is called quadratic polynomial.

$\therefore$ (i) (iii) and (iv) are quadratic polynomial.

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

Solution:

```
2x-3) 6x² - 7x-3 ( 3x+1
      6x² - 9x
      -     +
      ----------
            2x -3
            2x -3
            -   +
      ----------
             0      [remainder]
```

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

Lesson-3

(3 marks question)

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 algebraically?

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

(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 $a_1, a_2, b_1, b_2, c_1, c_2$

Solution: $a_1=5$ and $a_2=4$

$b_1=7$ $b_2=8$

$c_1=12$ $c_2=5$

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 $a_2=4$

$b_1=3$ $b_2=6$

$c_1=8$ $c_2=9$

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

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

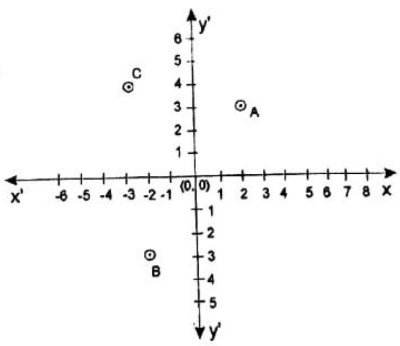
Solution: $\frac{a_1}{a_2}=\frac{2}{4}=\frac{1}{2}$

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

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

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

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



Solution:

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

(4 marks Questions)

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

Solution: $x+y=5$

Add $x-y=15$

$2x=20$

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

$x=10$

Now $x+y=5$

$10+y=5$ (put value of x)

$y=5-10$

$y=-5$

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

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

Solution: $x+3y=6$

$$2x - 3y = 12$$

$$3x \quad = 18$$

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

Now $x + 3y = 6$

$6 + 3y = 6$ (put value of x)

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

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

$$y = 0$$

$\therefore$ $x = 6$ and $y = 0$

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

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

$$7x + 12y + 8 = 0$$

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

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

$\therefore$ Lines intersect at a point .

Q.13 5 pencil and 7 pen together cost ₹ 50, Whereas 7 pencil 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

$\therefore$ According to question:

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

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

$$35x + 49y = 350$$

$$35x + 25y = 230$$

$$- \quad - \quad -$$

$$24y = 120$$

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

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

$$5x = 50 - 35$$

$$5x = 15$$

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

$\therefore$ 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 = ₹ y

According to question:

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

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

$$10x + 6y = 70$$

$$10x + 20y = 140$$

$$-14y = -70$$

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

Put $y = 5$ in equation $5x + 3y = 35$, we get

$$5x + 3(5) = 35$$

$$5x + 15 = 35$$

$$5x = 35 - 15 = 20$$

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

$\therefore$ cost of an orange = ₹4

cost of an apple = ₹5

Q.15 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.16 **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 the value of x in (i) we get

$$3y - y = 26$$
$$2y = 26$$
$$y = \frac{26}{2} = 13$$

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

$$x - 13 = 26$$
$$x = 26 + 13 = 39$$

$\therefore$ first number = 39

second number = 13

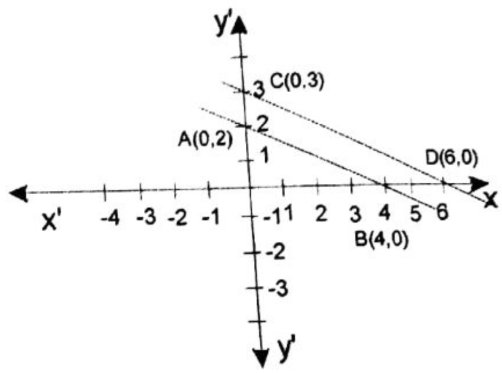
Q.17 Solve the pair of equation $x + 2y - 4 = 0$ and $2x + 4y - 12 = 0$ graphically.

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.

$\therefore$ pair of equation has no solution

Lesson-4

(3 marks question)

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

$\therefore \quad x^2 - 2x = -x(3-x)$ 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 $x = -2$

$x = 5, -2$

$\therefore$ roots of the quadratic equation are 5 and −2.

Q.5 Find the discriminant 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: $x^2 - 2x + 1 = 0$

$ax^2 + bx + c = 0$

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

$D = b^2 - 4ac$

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

$= 4 - 4 = 0$

Here $D = 0$ $\therefore$ 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: $2x^2 - 7x + 3 = 0$

$ax^2 + bx + c = 0$

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

$D = b^2 - 4ac$

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

$= 49 - 24 = 25$

$D > 0$ $\therefore$ roots are real and 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 $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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

$$=\frac{5\pm1}{6}$$

$$x=\frac{5+1}{6}=\frac{6}{6}=1 \quad , \quad x=\frac{5-1}{6}=\frac{4}{6}=\frac{2}{3}$$

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

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

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

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

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

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

$=4+32=36$

$$x=\frac{-b\pm\sqrt{D}}{2a}=\frac{2\pm\sqrt{36}}{2\times1}=\frac{2\pm6}{2}$$

$$x=\frac{2+6}{2}=\frac{8}{2}=4 \quad , \quad x=\frac{2-6}{2}=\frac{-4}{2}=-2$$

The roots of 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: $2x^2+x-6=0$

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

$D=b^2-4ac$

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

$=1+48=49$

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

$$x=\frac{-b\pm\sqrt{D}}{2a}=\frac{-1\pm\sqrt{49}}{2(2)}=\frac{-1\pm7}{4}$$

$$x=\frac{-1+7}{4}=\frac{6}{4}=\frac{3}{2} \quad , \quad x=\frac{-1-7}{4}=\frac{-8}{4}=-2$$

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

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

Solution: Let the smaller of the two consecutive odd positive integers be x then the second integer will be $x+2$.

According to the question:

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

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

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

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

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

$2 \neq 0$

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

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

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

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

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

$x = -13$ or $x = 11$

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

$\therefore \quad x = 11$

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

$ax^2 + bx + c = 0$

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

$D = b^2 - 4ac$

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

$= 4 - 4k$

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

or $4 - 4k = 0$

or $4 = 4k$

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

$\therefore \quad 1 = k$

$\therefore$ value of $k = 1$

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

$k^2 - 24 = 0$

$k^2 = 24$

$k^2 = 4 \times 6$

$$k = \pm\sqrt{4 \times 6}$$

$$k = \pm 2\sqrt{6}$$

value of $k = \pm 2\sqrt{6}$

Lesson-5

(3 marks question)

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

$a_1 =$ ☐

$a_2 =$ ☐

$a_3 =$ ☐

$a_6 =$ ☐

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

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 the 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 $d = 10$ write the first term, third term and sixth term.

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

$a_2 = 10 + 10 = 20$

$a_3 = 10 + 20 = 30$

$a_4 = 10 + 30 = 40$

Q.5 For a given AP, find the missing number ?

-4, ☐ , 0, 2, ☐ 6, ☐ 10- - - -

Solution: (i) = -2

(ii) = 4

(iii) = 8

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

Solution: n^{th} term $a_n = a + (n-1)d$

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

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

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

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

$= 2 + (10-1)2$

$= 2 + 9(2)$

$= 2 + 18 = 20$

$\therefore$ 10^{th} term $= 20$

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

Solution: $a_1 = 4$,

$d = -3$

$a_1 = 4$

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

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

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

First four term of the A.P = 4,1, -2, -5

(4 marks Questions)

Q.9 Which term of an 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 an 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 3rd term is 5 and the 7th term is 9.

Solution: $a_3 = a + 2d = 5$

$a_7 = a + 6d = 9$

Substract $\quad - \quad -$

$-4d = -4$

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

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 an AP: 2, 4, 6, 8....... 20 .

Solution: $a = 2$

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

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

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

$= 5[4 + (9 \times 2)]$

$= 5[4 + 18]$

$= 5 \times 22 = 110$

$\therefore$ Sum of 10 terms of an AP = 110

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

Solution: $a = 10$

$d = 20 - 10 = 10$

$n = 7$

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

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

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

$= \frac{7}{2} \times 80 = 40$

$= 280$

$\therefore$ Sum of the 7 terms of an AP = 280

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

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

Solution: $a_1 = 1 + 1 = 2$

$$a_2 = 1+2 = 3$$
$$a_3 = 1+3 = 4$$
$$a_4 = 1+4 = 5$$

$\therefore$ The first 4 term of an A.P: 2,3,4,5

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

Solution: $a_n = 5+n$

Put $n = 1,2,3$

$$a_1 = 5+1 = 6$$
$$a_2 = 5+2 = 7$$
$$a_3 = 5+3 = 8 \quad \ldots\ldots\ldots\ldots$$

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

$\therefore$ AP: 6,7,8.......... and $a_{10} = 15$ Ans.

Q.16 Find the sum of the first 5 multiple of 8.

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

$$a = 8$$
$$d = 16-8 = 8$$
$$n = 5$$
$$Sn = \frac{n}{2}[2a+(n-1)d]$$
$$= \frac{5}{2}[2\times 8+(5-1)8]$$
$$= \frac{5}{2}[16+4\times 8]$$
$$= \frac{5}{2}[16+32]$$
$$= \frac{5}{2}\times 48 \quad 24$$
$$= 120$$

$\therefore$ Sum of first 5 multiple of 8 =120

Lesson-6

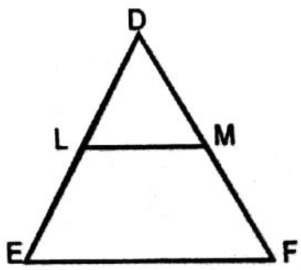
(3 marks question)

Q.1 State Thales Theorem

If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points ,the other two sides are divided in the same ratio.

Q.2 If ΔDEF, $LM \parallel EF$

Acc. to Thales theorem,



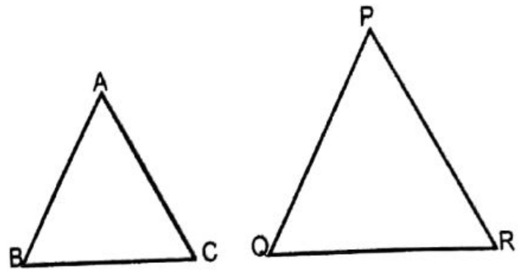
$$\frac{DL}{\square} = \frac{\square}{MF}$$ (Fill in the blank)

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

Q.3 $\Delta ABC \sim \Delta PQR$

then $\frac{ar(\Delta ABC)}{ar(\Delta PQR)} = \frac{AB^2}{\square} = \frac{\square}{QR^2} = \frac{AC^2}{\square}$ (Fill in the blank)

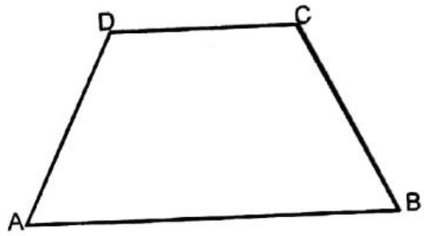
Answer: $\frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2}$



Q.4 Define Pythagoras theorem.

Answer: In a right triangle, the square of the hypotenouse in equal to the sum of the squares of the other two sides.

Q.5 From the figure ,trapezium ABCD write the parallel and non-parallel sides.

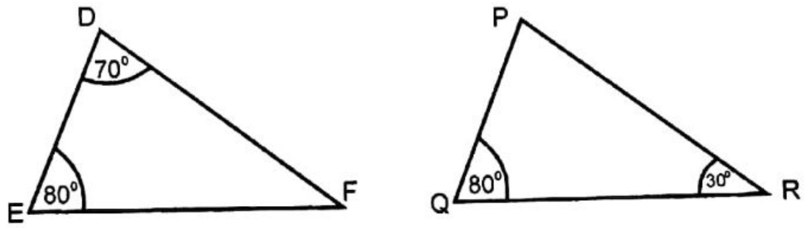


Answer: parallel sides: AB and DC

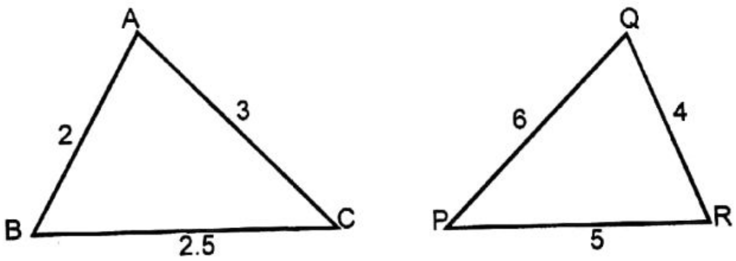
non-parallel sides: AD and BC

Q.6 Write the following similar triangles in symbolic form.

(i)



(ii)

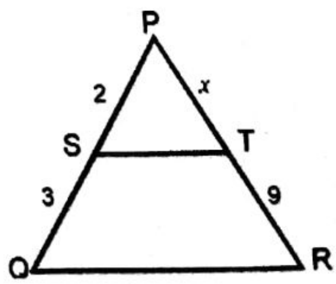


Answer: (i) $\Delta DEF \sim \Delta PQR$

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

(4 marks Question)

Q.7 In figure ΔPQR ,If $ST \parallel QR$ then find x .



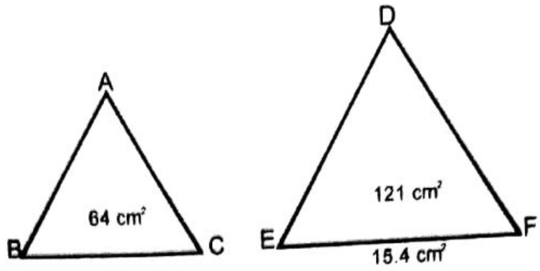
Solution: In ΔPQR , $ST \parallel QR$

$\therefore$ Acc. to Thales theorem,

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

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

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



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

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

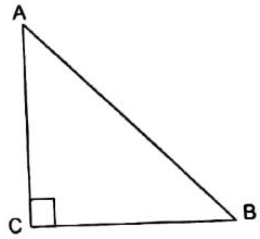
or $\quad \dfrac{ar(\Delta ABC)}{ar(\Delta DEF)} = \dfrac{BC^2}{EF^2}$ or $\dfrac{64}{121} = \dfrac{(BC)^2}{(15.4)^2}$

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

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

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

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



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

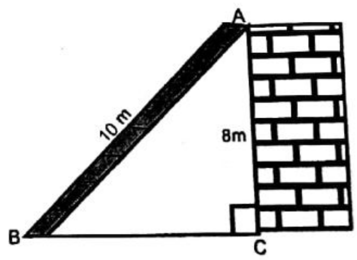
By Pythagoras theorem

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

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

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

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



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

height of window from ground $AC = 8m$

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

according to Pythagoras theorem

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

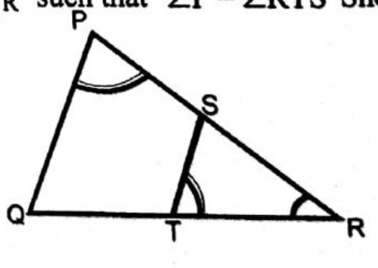
$(10)^2 = BC^2 + (8)^2$

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

$\therefore BC = 6m$

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

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



Solution: In ΔPQR

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

$\therefore$ Now in ΔRPQ and ΔRTS

$\angle R = \angle R$ (common)

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

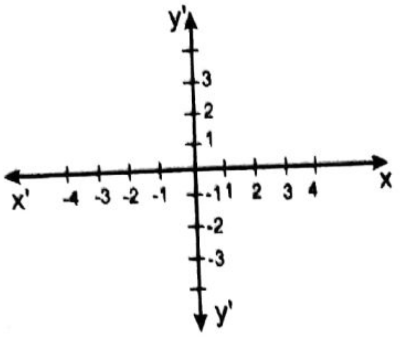
$\therefore$ Acc. to AA rule of similarity

$\Delta RPQ \sim \Delta RTS$

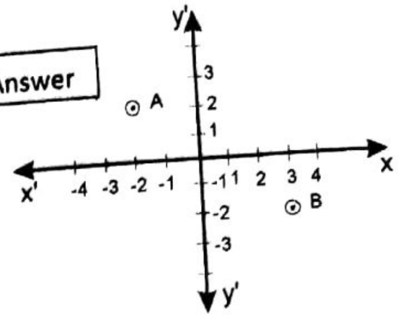
Lesson-7

(3 marks question)

Q.1 Plot any point in second and fourth quadrant.

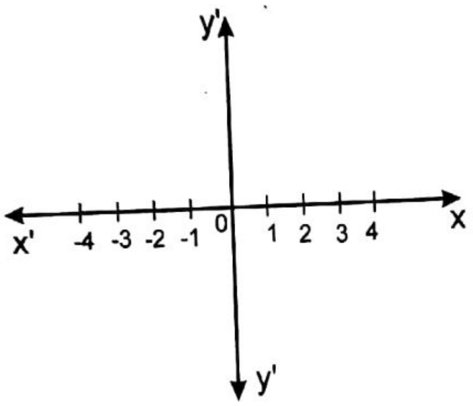


Answer

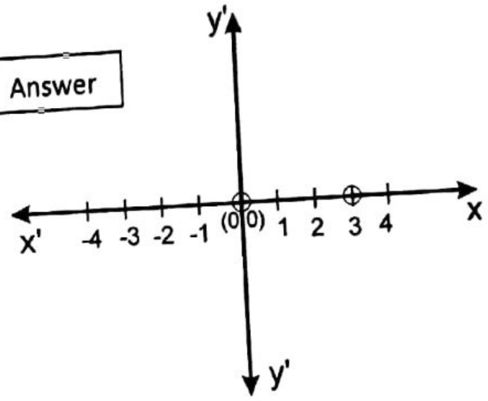


A = (-2,2) , B = (3,-2)

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



Answer



Origin: $(0,0)$, any point: $(3,0)$

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

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

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

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

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

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

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

Q.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 ratio m:n

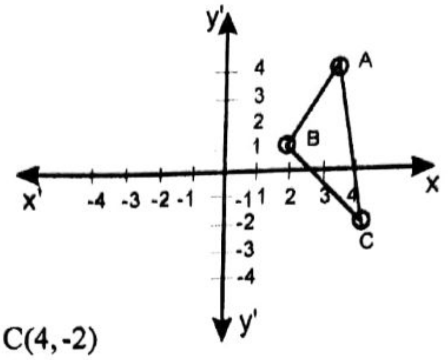
and $x = \frac{mx_2 + nx_1}{m+n}$ then find $y = ?$

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

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

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

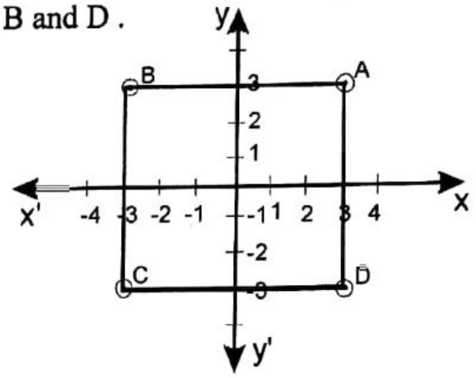
Q.7 Plot three points on a graph paper such that on joining the points, it becomes triangle.



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

(4 marks Question)

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



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

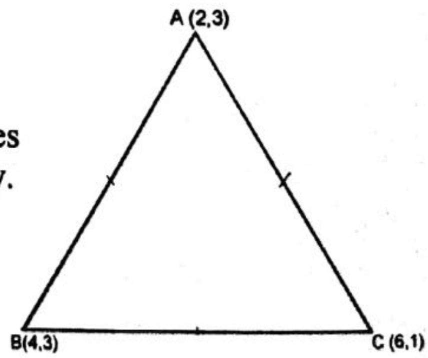
Q.9 Find the abscissa of a point which divides the line segment joining the points A (1,7) and B(5,3) in the ratio 2:3 internally.

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

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

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

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



Q.10 If a ΔABC whose vertices are then find the co-ordinates of the mid points D,E and F of sides AB, BC and AC respectively.

Solution: Co-ordinates 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-ordinates of mid point E of side BC

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

Co-ordinates of mid point F of side AC

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

Q.11 Find the value of k for which the points A (7,2), B(5,1), 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)

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

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

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

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

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

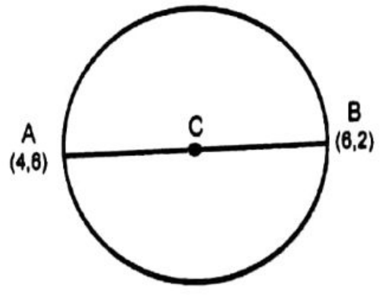
$$\Rightarrow \quad k=\frac{3}{-2}$$

Q.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.

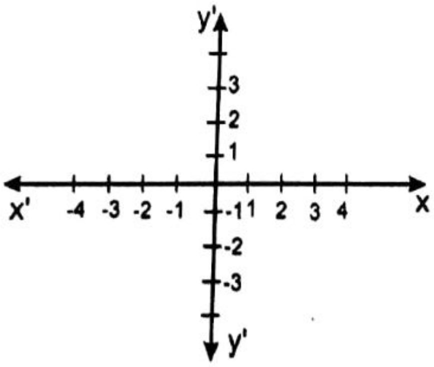
Answer: $C(x,y)=(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2})$

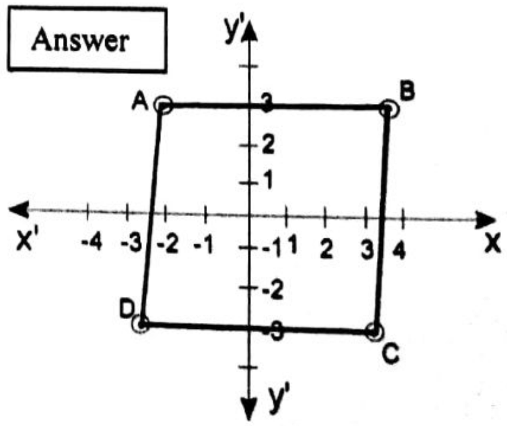
$$=(\frac{4+6}{2},\frac{6+2}{2})$$

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



Q.13 Plot the vertices of the parallelogram on the graph paper.
A(−2,3), B(4,3), C(3,−3) D(−3,−3)





Lesson-8

(3 marks question)

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

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

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

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

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

$= 5 \times 1 = 5$

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

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

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

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

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

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

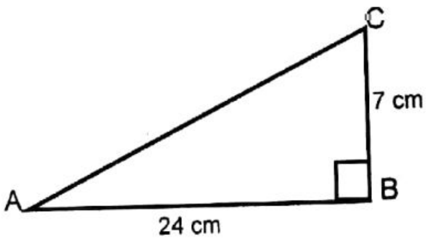
$= 4 \times \frac{1}{2} \times \frac{1}{2}$ $(\because \sin 30^0 = \frac{1}{2}, \cos 60^0 = \frac{1}{2})$

$= 1$

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

Solution: In ΔABC , $\angle B = 90^0$

$\because \tan A = \frac{Base}{Perpendicular}$



(4 marks question)

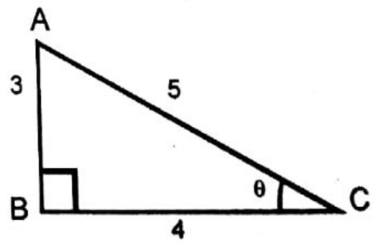
Q.6 Find the value of $\cos\theta$, $\tan\theta$, $\sin\theta$ from the following diagram.

Solution:

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

$$\tan\theta = \frac{Perpendicular}{Base} = \frac{AB}{BC} = \frac{3}{4}$$

$$\sec\theta = \frac{Hypotenuse}{Base} = \frac{AC}{BC} = \frac{5}{4}$$



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

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

$= \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} + \frac{1}{2} \times \frac{1}{2}$

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

$= \frac{3+1}{4} = \frac{4}{4} = 1$ $\qquad (\because \sin 60^o = \cos 30^o = \frac{\sqrt{3}}{2}$ *and* $\sin 30^o = \cos 60^o = \frac{1}{2})$

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

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

$= \sin(90^0 - 23^0) + \cos(90^0 - 15^0)$ $(\because \sin(90^o - \theta) = \cos\theta = and \cos(90^o - \theta) = \sin\theta)$

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

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

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

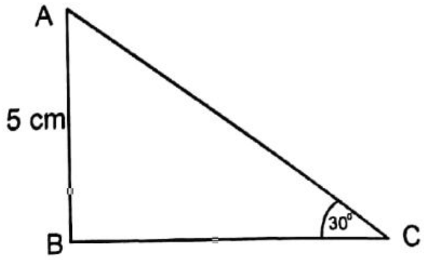
$= \sin 25^0 \cos(90^0 - 25^0) + \cos 25^0 \sin(90^0 - 25^0)$

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

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

$= 1$

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



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

$\angle ACB = 30^o$ *and* $AB = 5cm$

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

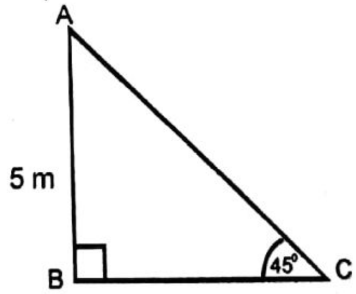
or $\frac{5}{BC} = \frac{1}{\sqrt{3}}$ $\qquad (\because \tan 30^0 = \frac{1}{\sqrt{3}})$

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

Lesson-9

(4 marks question)

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

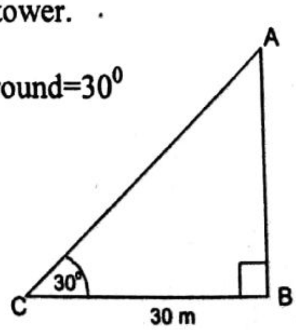


Solution: In right angle ΔABC , $\angle B = 90^0, \angle C = 45^0$ and AB = 5cm

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

$\therefore BC = 5$ m

Q.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.



Solution: 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

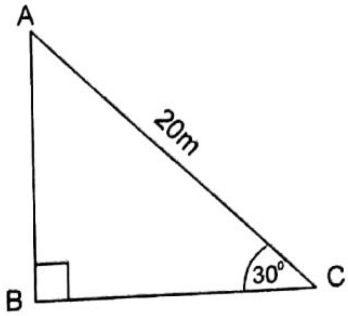
In right angle ΔABC

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

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

Q.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.



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

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

Height of pole = AB

In right angle 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

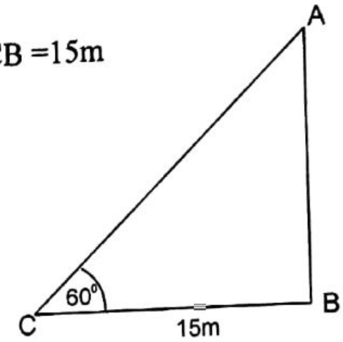
Q.4 A tower stands vertically on the ground. From a point on the ground which is 15m a way from the foot of the tower, the angle of elevation of the top of the tower is 60^0. Find the height of the tower.

Solution: Let AB represent the tower.

The distance of the point from the foot of the tower CB =15m

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

$\therefore$ in right angled ΔABC



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

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

$\therefore AB = 15\sqrt{3}m$

$\therefore$ Height of the tower = $15\sqrt{3}$ m

Q.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.

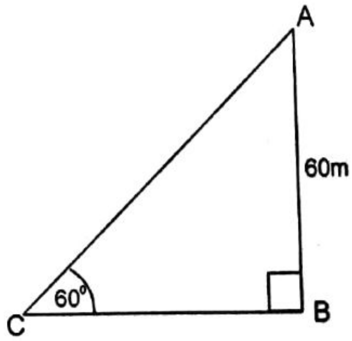
Solution: Let AC represents lenght of the string

The height of kite = 60m

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

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 = $40\sqrt{3}m$

Lesson-10

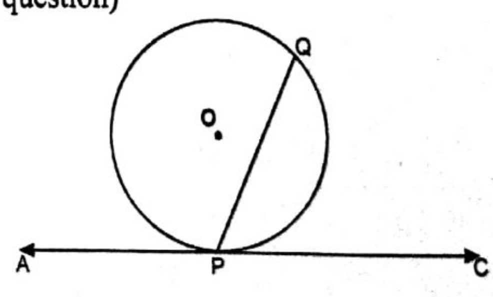
(3 marks question)

Q.1 From figure, write the following:

(i) Name of the tangent

(ii) Point of contact

(iii) Name of the chord



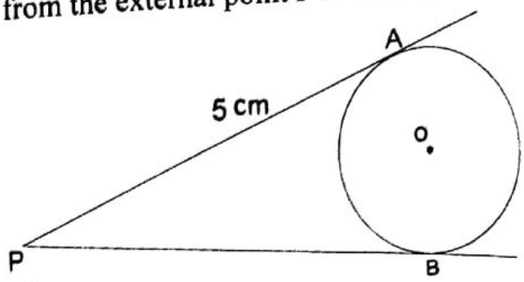
Solution:

(i) Tangent AC

(ii) Contanct point P

(iii) Chord PQ

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

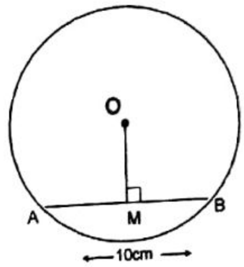


Solution: We know that the length of tangents drawn from an external point to a circle are equal.

$\therefore$ If PA=5cm

then PB=5cm

Q.3 In given figure, lenght of the chord AB is 10 cm and O_1 is centre of the circle. $OM \perp AB$ then find AM .



Solution: $AB = 10cm$

$OM \perp AB$

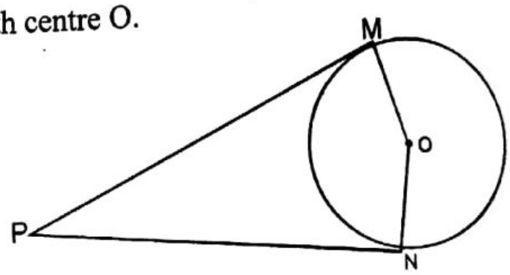
We know that perpendicular from the centre of a circle to the chord, bisect the chord.

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

Q.4 In figure, PM and PN are the tangents to the circle with centre O.

(i) Find $\angle OMP$, $\angle ONP$

(ii) Are $PM = PN$?



Solution: (i) We know that the tangent of the 90^0 circle is pependicular 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.

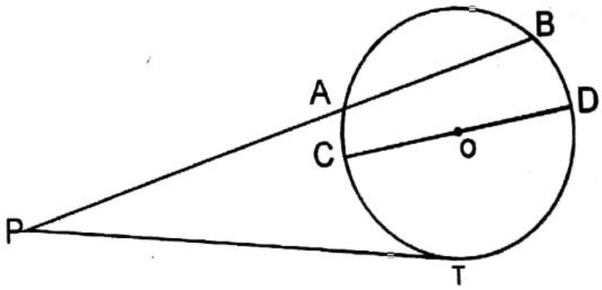
$\therefore PM = PN$

Q.5 Write from the figure:

(i) Name of the secant

(ii) Diameter

(iii) Longest chord



Solution:

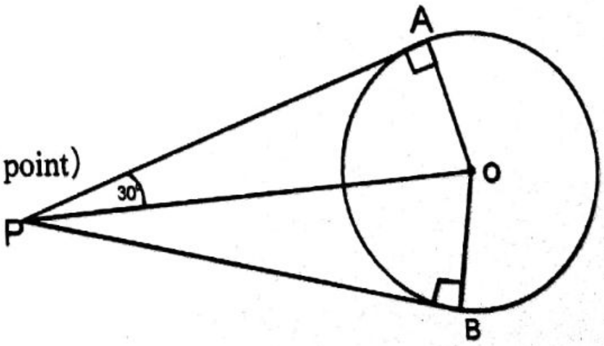
(i) Secant PAB

(ii) Diameter CD

(iii) Longest chord CD

(4 marks question)

Q.6 From figure, find $\angle BPO$.



Solution: In ΔPAO and ΔPBO

$\angle OAP = \angle OBP$ (each 90^o)

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

$PO = PO$ (common)

By RHS of congurency

$\Delta PAO \cong \Delta PBO$

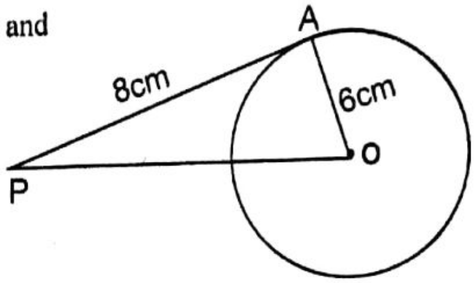
$\therefore \angle APO = \angle BPO$ (c.p.c.t)

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

$\therefore \angle BPO = 30^0$

Q.7 From figure, find OP .

Solution: PA is the tangent, OA is the radius and



$\angle PAO = 90^0$

$\therefore$ In right angled ΔPAO

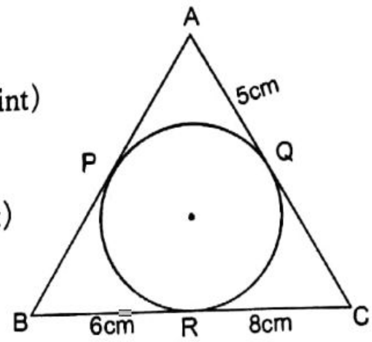
$OP^2 = AP^2 + OA^2$

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

$OP^2 = 64 + 36 = 100$

$OP^2 = 10^2$ or $OP = 10cm$

Q.8 From figure, find the length of AB and AC



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

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

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

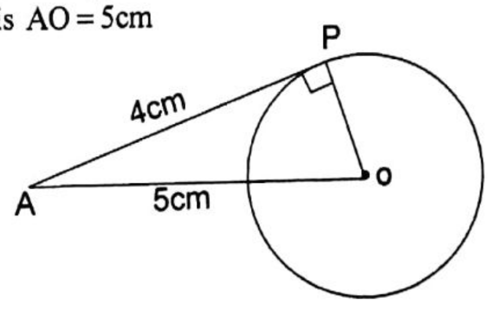
$\therefore$ side $AB = AP + BP = 5 + 6 = 11cm$

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

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

Solution: 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

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

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

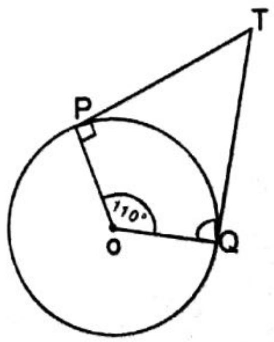
$25 = 16 + OP^2$

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

$\therefore OP = 3cm$

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

Solution: In quadrilatrel OQTP



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

(sum of four angles of the quadrilatrel)

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

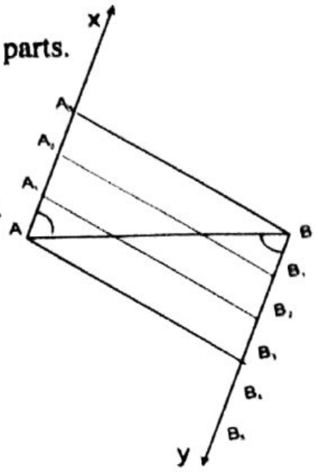
$$\angle PTQ + 290^0 = 360^0$$

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

Lesson-11

(3 marks question)

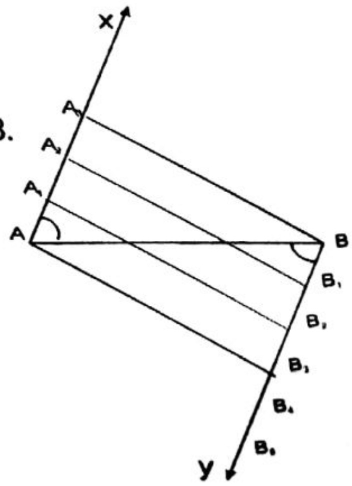
Q.1 Draw a line segment of length 10 cm and divide it in 5 equal parts.



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 $BB_1 = B_1B_2 = B_2B_3 = B_3B_4 = B_4B_5$
6. Join with 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
7. Therefore line segment AB is divided in five equal parts.

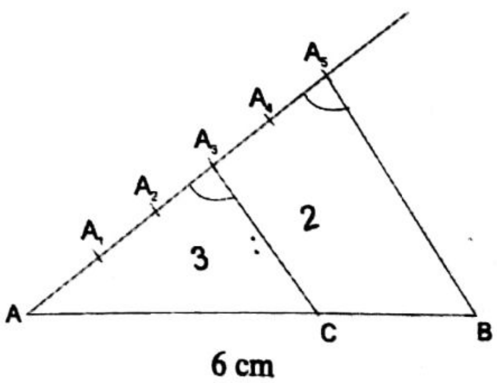
Q.2 Draw a line segment of lenght 6 cm and divide it in three equal parts.



Steps of construction:

1. Take a line segment AB of length 6m.
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 $BB_1 = B_1B_2 = B_2B_3 = B_3B_4 = B_4B_5$
6. Join with 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
7. Therefore line segment AB is divided in 3 equal parts.

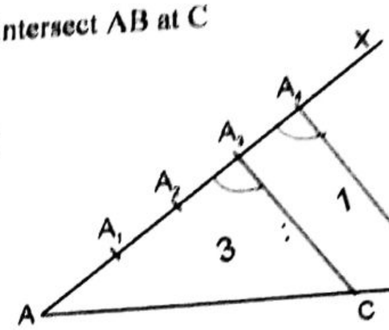
Q.3 Divide the line segment of length 6cm in ratio 3:2



Steps of construction:

1. Take a 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 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 the line segment of length 6cm in ratio 3:1



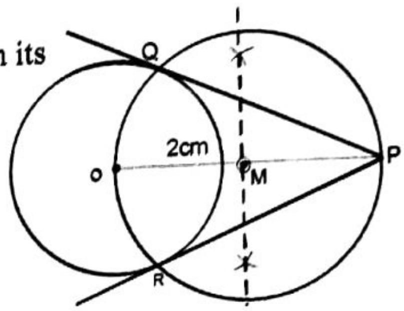
Steps of construction:

1. Take a 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_4
5. From point A_3 draw a parallel line to BA_4 which intersect AB at C
6. Now *AC: CB= 3:1*

(4 marks question)

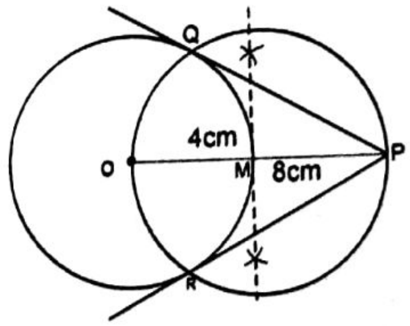
Q.5 Draw a circleof radius 2cm. From a point 5cm away from its centre, construct the pair of tangents to the circle.



Steps 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.
4. 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.

Q.6 Draw a circle of radius 4cm. From a point 8cm from its centre, construct the pair of tangents to the circle.



Steps of construction:

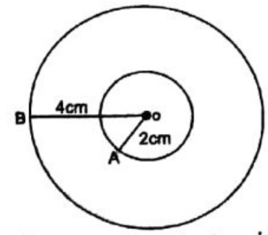
1. Draw a circle of radius 4 cm with centre O and take point P away from its centre at distance 8cm.
2. Join OP and bisect it at M.
3. Draw a circle with centre M and radius OM which intersect the given circle at Q and R.
4. Join PQ and PR
5. Therefore PQ and PR are required tangents.

Q.7 Draw two concentric circles with radius 4cm and 2cm

Steps of construction:

1. Take a point O.

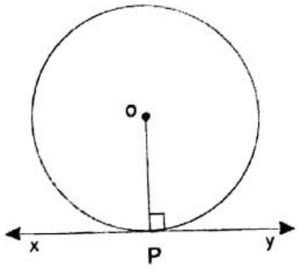
2. Draw a circle of radius 2 cm taking centre O.
3. Draw another circle on centre O with radius 4cm
4. Those circles whose centres are at the same point called concentric circles.



Q.8 Draw a circle. Take a point P on it. Join it with centre O. Draw tangent 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.

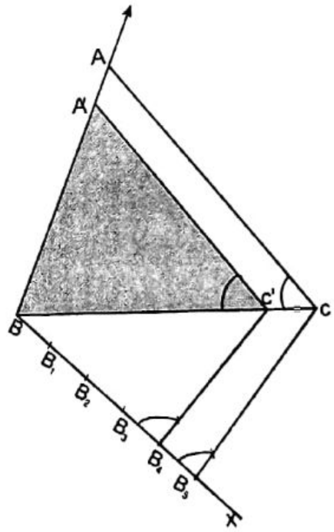


Q.9 Take a triangle. Construct a triangle similar to a given triangle ABC with its sides equal $\frac{4}{5}$ to of the corresponding sides of the triangle ABC.

Steps of construction:

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 CA paralell to C'A'.

Therefore A'BC' is required triangle.



Lesson-12

(3 marks question)

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

Solution: Radius of the circle $= 7$ cm

Circumference of the circle $= 2\pi r$

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

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

Solution: Diameter of the circle = 14 cm

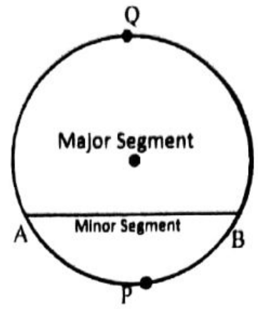
$$\therefore \text{ Radius } = \frac{14}{2} = 7 \text{ cm}$$

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

Q.3 Write the names of any four circular objects.

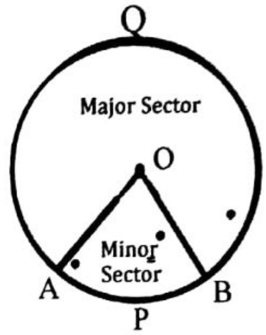
Solution: Cycle wheels, washer, bangles, paped, dart board

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



Solution: Major Segment: AQB
Major Segment: APB

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



Solution: Major sector : OAQB
Minor sector : OAPB

Q.6 Find radius of the circle whose circumference is 22cm.
Solution: Circumference of the circle = 22 cm

$$\therefore \quad 2\pi r = 22$$

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

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

(4 marks Question)

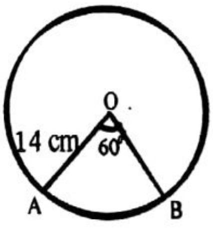
Q.7 In a circle of radius 14cm, an are subtends an angle 60^0 at the centre. Find the length of the arc.

Solution: Radius of the circle = 14 cm

Central angle $\theta = 60^0$

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

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



Q.8 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.

Solution: Radius of the circle = 21cm

Central angle $\theta = 60^0$

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

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

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

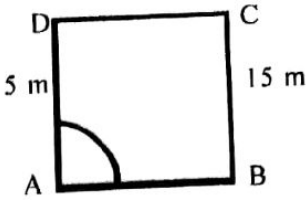
Q.9 A horse is tied to a peg at one corner of a square shaped grass field of side 15m by means of a 5m long rope. Find the area of that part of the field in which horse can graze.

Solution: 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

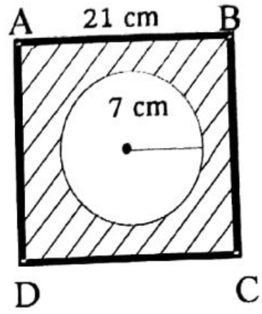


which horse can graze $= \pi r^2 \frac{\theta}{360}$

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

$$= 19.625 m^2$$

Q.10 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.



Solution: Side of the square = 21 cm

Area of the square = $(\text{side})^2$

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

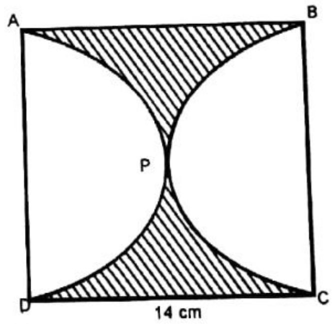
∴ Radius of the circle = 7 cm

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 $= 441 - 154 = 287 \text{ cm}^2$

Q.11 Find the area of the shaded region in given figure, If ABCD is a square of side 14cm and APD and BPC are semicircles.



Solution: Side of square ABCD = 14 cm

Area of the square = side^2

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

Diameter of semicircle APD = 14 cm

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

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-circles $= 77 + 77 = 154 \text{ cm}^2$

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

Lesson-13

(3 marks question)

Q.1 Give three examples of cuboid from daily life.

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

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

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

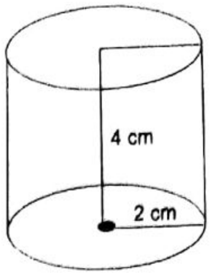
Q.3 The diameter of a sphere is 4cm then find its radius.

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

$= \frac{4}{2}$

$= 2$ cm

Q.4 Fill in the blanks from figure:



(i) r = ________

(ii) h = ________

Solution: (i) r = 2cm

(ii) h = 4cm

Q.5 Match the following:

(a) Match box	(i) Sphere
(b) cap of a Turks	(ii) Cuboid
(c) Footbal	(iii) Cube
(d) Dice	(iv) Cone

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

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

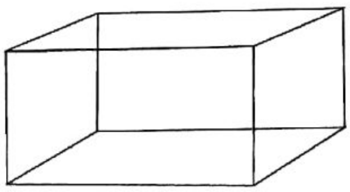
Solution: slant height = ℓ

radius = r

height = h

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

Q.7 Draw a diagram of a cubiod. Count its faces and edges.



Solution: faces = 6

edges = 12

(4 marks Question)

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

Solution: Side of a cube = a = 4cm

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

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

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

Solution: Diameter of the cylinder = 14cm

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

height $h = 10\text{cm}$

$\therefore$ Volume $= \pi r^2 h$

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

$$= 1540\text{cm}^3$$

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

Height of the cube $= 21\text{cm}$

Radius of the base of cone $r = 6\text{cm}$

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

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

$= 792\text{cm}^3$

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

Solution: Radius of the hemisphere (r) $= 14$ cm

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

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

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

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

Solution: Volume $= (\text{side})^3$

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

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

side = 4cm

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

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

$= 5 \times 10 \times 4$

$= 200\text{cm}^3$

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

Solution: radius of a hemi-spherical bowl =7cm

volume of a hemi-spherical $= \dfrac{2}{3}\pi r^3$

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

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

Lesson-14

(3 marks question)

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

Upper limit = 150

Lower limit =100

Q.2 Write the class mark of the class internal 10−30.

Solution:

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

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

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

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

Solution: $\text{Mean} = \frac{\textit{sum of the observations}}{\textit{Number of observations}}$

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

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

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

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

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

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

Q.5 Write names of three methods to find mean.

Solution:
(i) Direct method
(ii) Assumed mean method
(iii) Step deviation method

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

Solution: Class size = upper class limit - lower class limit

=100-60=40

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

Solution: $l =$ lower limit of median class.
$f =$ frequency of median class

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

Solution: Ascending order of given data = 2,3,4,5,6,7,7,8,9

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

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

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

Median $= 5^{th}$ observation means 6

(4 marks question)

Q.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

Solution:

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
	$\Sigma fi = 20$		$\Sigma f_i x_i = 162$

From above data

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

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

Q.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

Soluation:

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
	$\sum f_i = 20$	$\Sigma f_i x_i = 620$

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

$= \frac{620}{20}$

$= 31$

Q.11 Marks obtained by 80 students of a class is 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

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

$\therefore$ Model class = 30-40

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

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

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

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

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

$$= 30 + 6.25 = 36.25$$

Q.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 distibution.

Soluation:

Production	Cummulative 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

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

Daily income	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 cummulative frequency distribution.

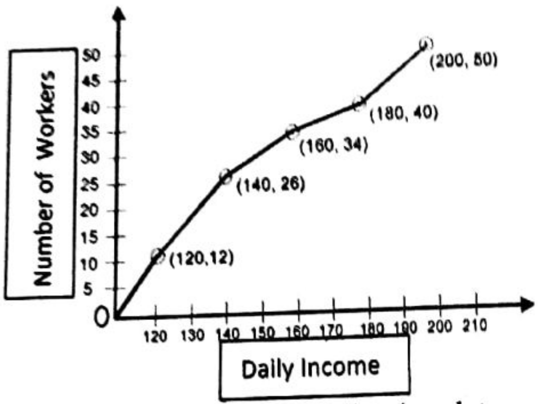
Soluation:

Daily Income	Cummulative 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

Q.14 Draw Ogive of the following table.

Daily Income	less than120	less than140	less than160	less than180	less than 200
Number of workers	12	26	34	40	50

Soluation:



Q.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

Soluation: First we arrange the marks in ascending order and prepare a cummulative 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 50th and 51th observation

50th observation is $= 28$

51th observation is $= 29$

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

Lesson-15

(3 marks question)

Q.1 Write formula of probability

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

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

Soluation: Let E be the probability of red marbles.

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

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

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

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

Soluation: Total outcomes $= 2$

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

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

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

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

$= 1 - 0.05 = 0.95$

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

Soluation: Total outcomes $= 6$

Outcomes greater than4 $= 2$

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

(4 marks question)

Q.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?

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

number of red balls $= 8$

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

Q.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.

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

Number of white marbles $= 2$

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

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

Soluation: Total outcomes of dice $= 6$

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

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

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

Soluation: Total outcomes of dice $= 6$

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

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

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

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

Q.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

Soluation: Total outcomes $= 6$

Number of E $= 2$

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

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

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