UDAAN

2025

Revision

Mathematics | **Lecture - 01**

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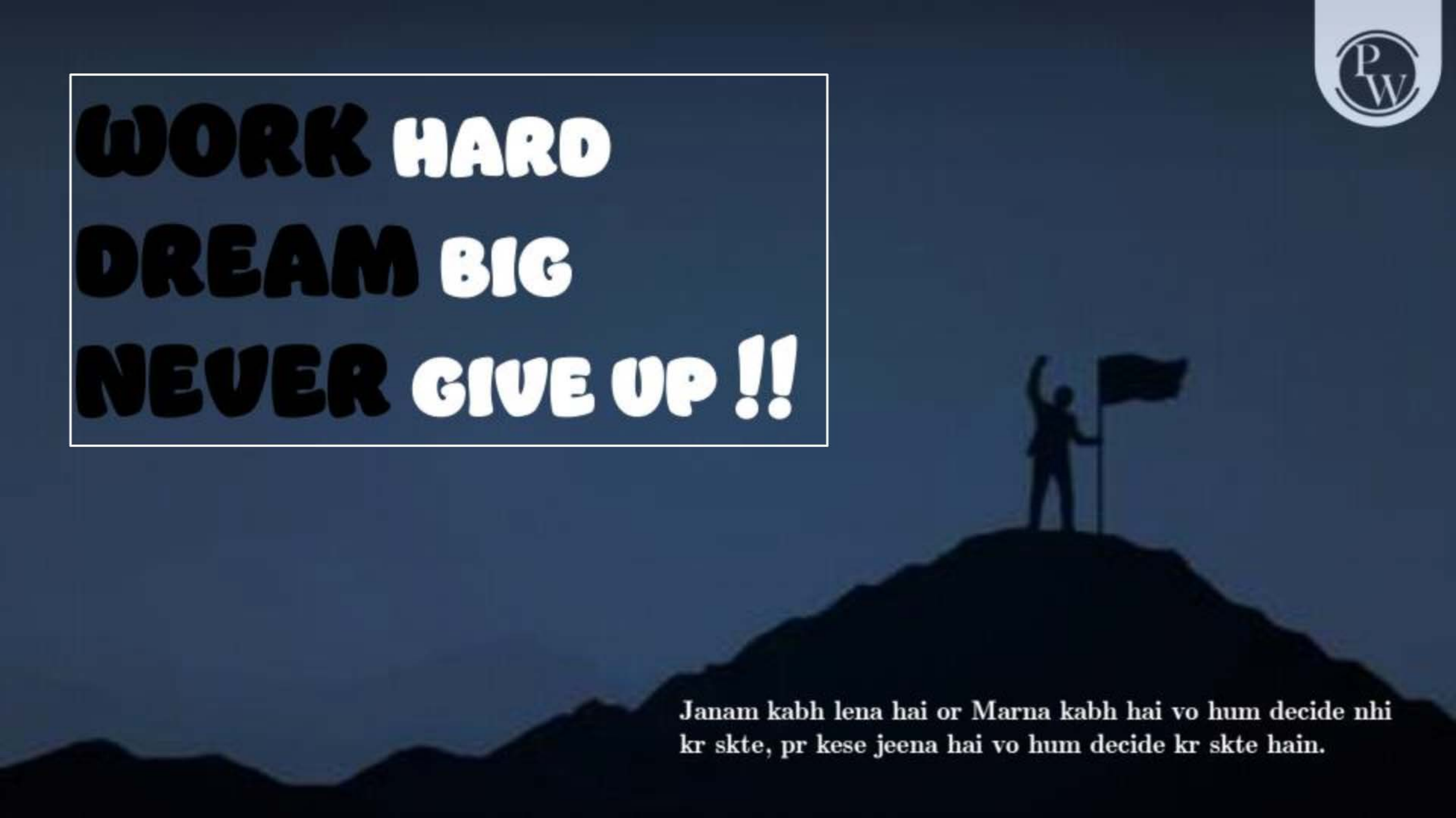
Topics *to be covered*

1. Revision
2. Real numbers
3. Polynomials
4. Pair of linear equations in two variables.

WORK HARD
DREAM BIG
NEVER GIVE UP !!



Janam kabh lena hai or Marna kabh hai vo hum decide nhi kr skte, pr kese jeena hai vo hum decide kr skte hain.

Topic : Real Number

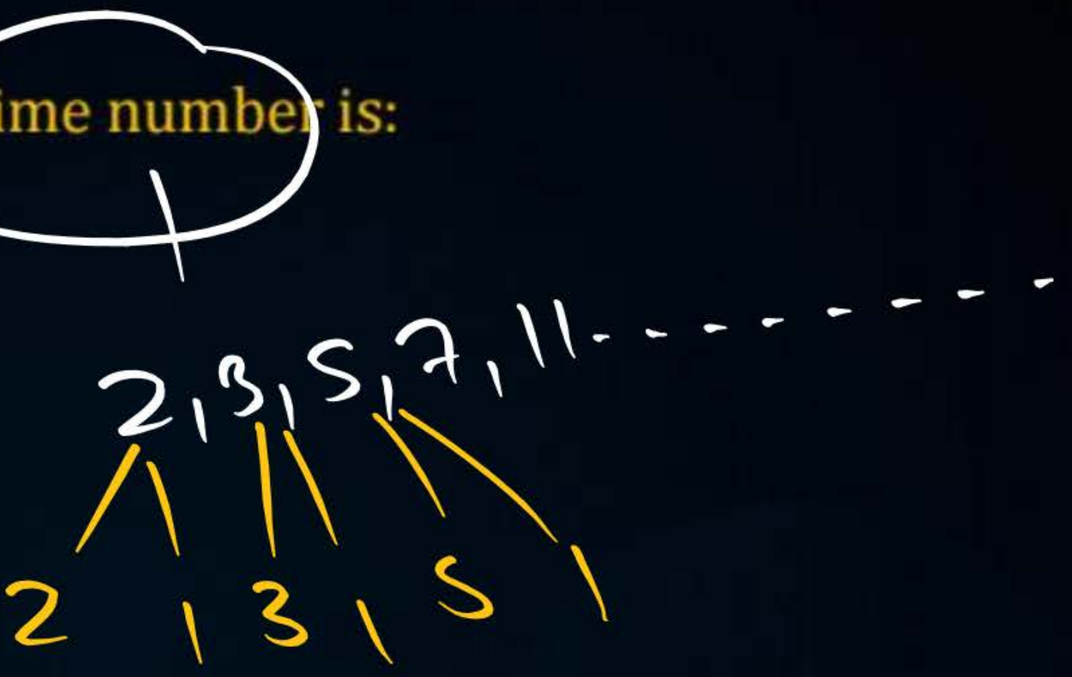
#Q. The total number of factors of a prime number is:

A 1

B 0

C 2

D 3



Topic : Real Number

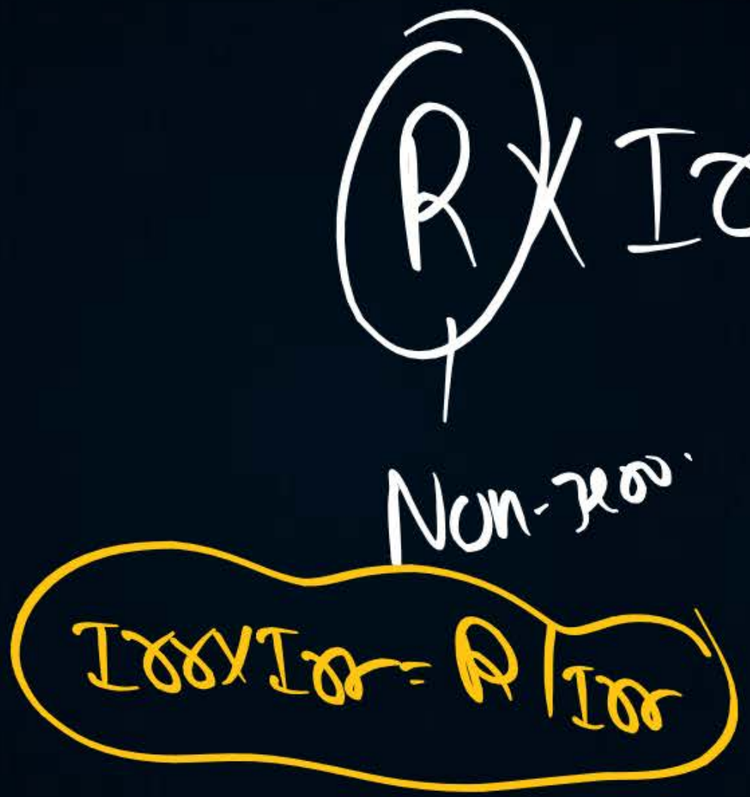
#Q. The product of a non-zero rational and an irrational number is

A Always irrational

B Always rational

C Rational or irrational

D one



Topic : Real Number

#Q. The sum of rational and irrational number is:

A Rational

B Irrational

C Both of above

D None of above

Topic : Real Number

#Q. By using prime factorization method, find the L.C.M. and H.C.F. of 1296 and 2520.

$1296 = 2^4 \times 3^4 \times 7^0 \times 5^0$

$2520 = 2^3 \times 3^2 \times 7^1 \times 5^1$

$HCF = 2^3 \times 3^2 \times 7^0$

HCF = 72

$LCM = 2^4 \times 3^4 \times 7^1 \times 5^1$

$= 16 \times 81 \times 7 \times 5$

$=$ [ ]

2	1296
2	648
2	324
2	162
3	81
3	27
3	9
3	3
	1

2	2520
2	1260
2	630
3	315
3	63
3	21
7	7
	1

Topic : Real Number

#Q. $\pi - 22/7$ is:

A rational number

B A prime number

C An irrational number

D 0

$\pi \rightarrow$ irrational

$\pi = N \cdot T \cdot N \cdot R$

$\pi \approx \frac{22}{7}$

Topic : Real Number

#Q. Find the HCF and LCM of $8x^2y^2$, $12x^3y^2$ and $24x^4y^3z^2$, where x, y are prime numbers.

$8x^2y^2 = 2^3 \times x^2 \times y^2 \times 3^0 \times z^0$

$12x^3y^2 = 2^2 \times 3^1 \times x^3 \times y^2 \times z^0$

$24x^4y^3z^2 = 2^3 \times 3^1 \times x^4 \times y^3 \times z^2$

HCF $= 2^2 \times 3^0 \times x^2 \times y^2 \times z^0$

$= \boxed{4x^2y^2}$

LCM $= 2^3 \times 3^1 \times x^4 \times y^3 \times z^2$

$= \boxed{24x^4y^3z^2}$

Topic : Real Number

#Q. Check whether 6^n can end with the digit 0 for any natural number n.

6^n

$n=1,\ 6^1 = 6$

$n=2,\ 6^2 = 36$

$n=3,\ 6^3 = 216$

$6^n = (2\times3)^n$

$6^n = 2^n \times 3^n$

$(ab)^m = a^m b^m$

CASE BASED

For a number 6^n to end with the digit zero (0), it must be divisible by 5, as we already know that any number having unit place as 0 or 5 is divisible by 5. Prime factorization of $6^n = (2 \times 3)^n$.

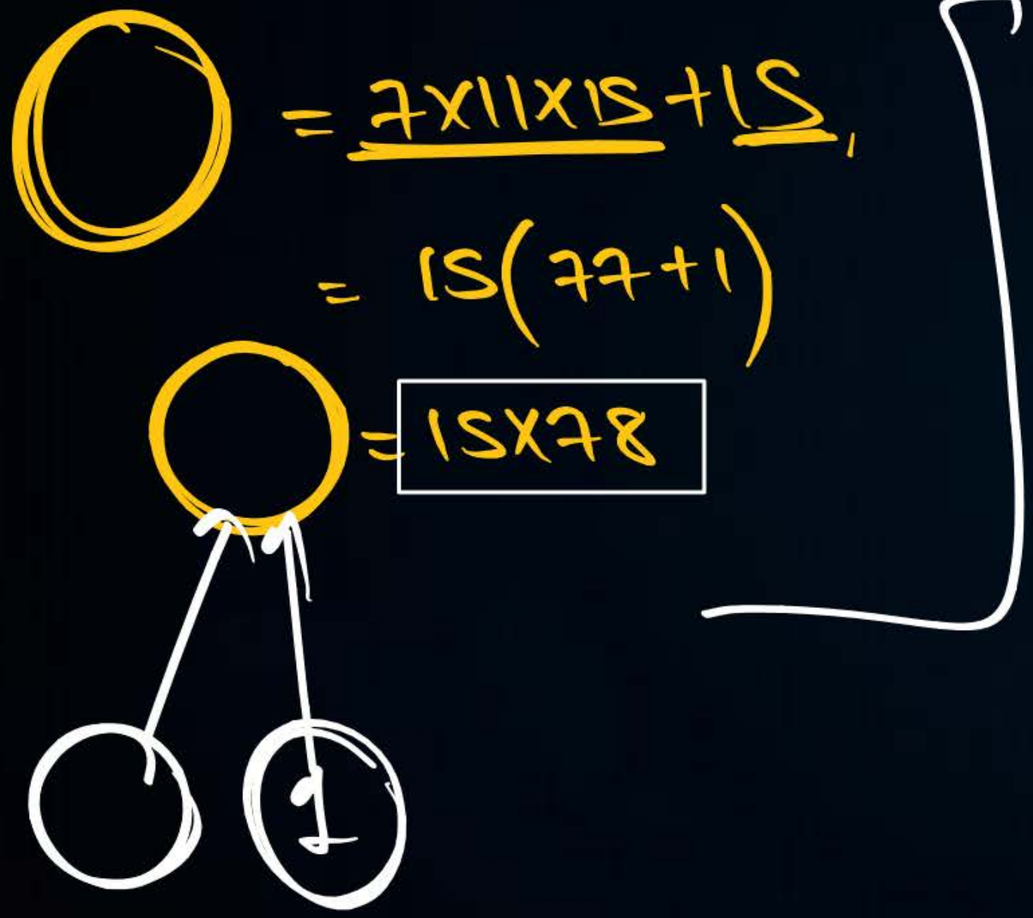
As we can see that, the prime factorization of 6^n doesn't contain prime number 5.

Therefore, it is clear from above that, 6^n is not divisible by 5 for any natural number n and hence, it proves that 6" can never end with the digit 0 for any natural number n.

Topic : Real Number

#Q. $7 \times 11 \times 15 + 15$ is a composite number. Explain.

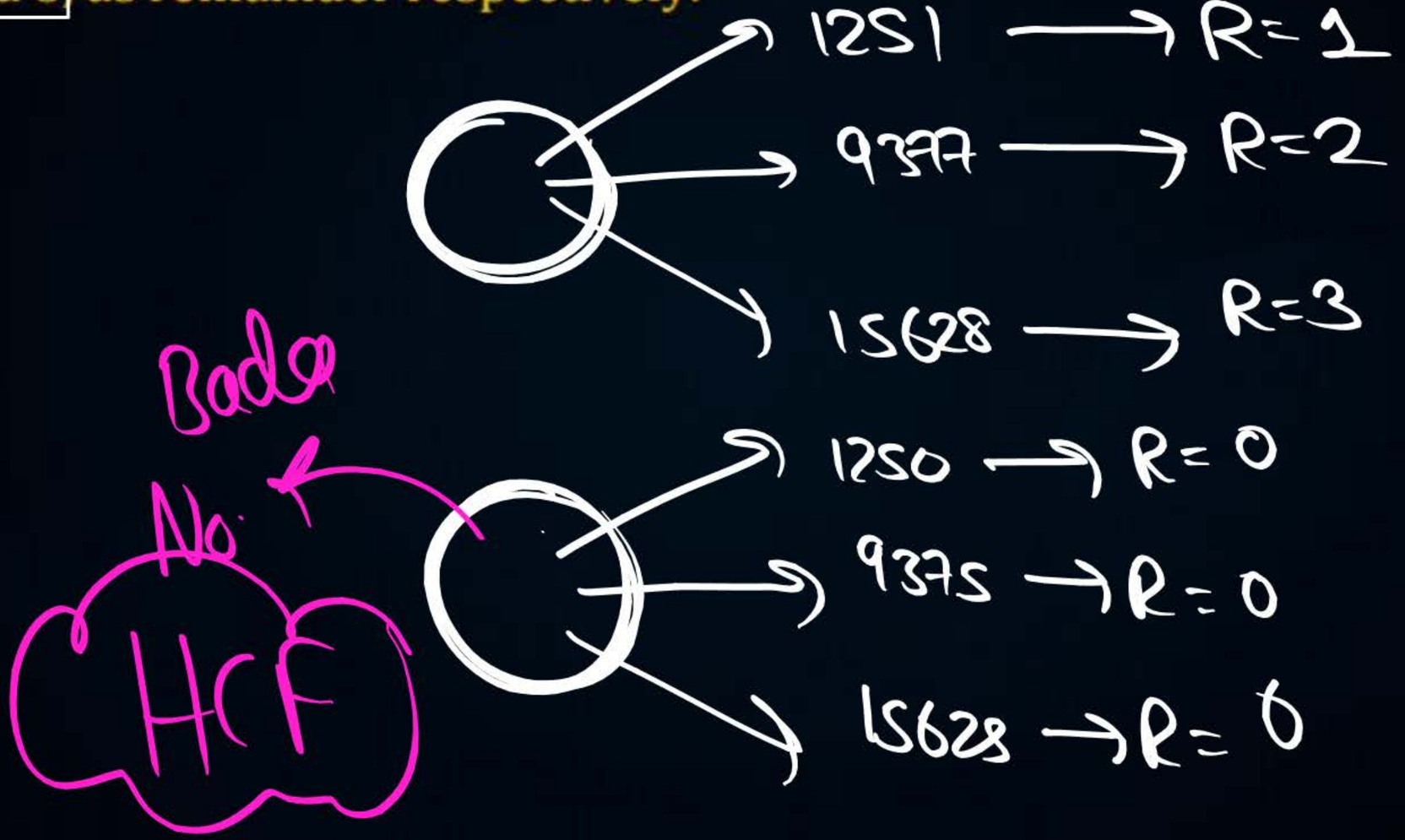
→ more than 2 factor.



clearly the no has 1 and 78 as its factor.
∴ it will have more than 2 factors.

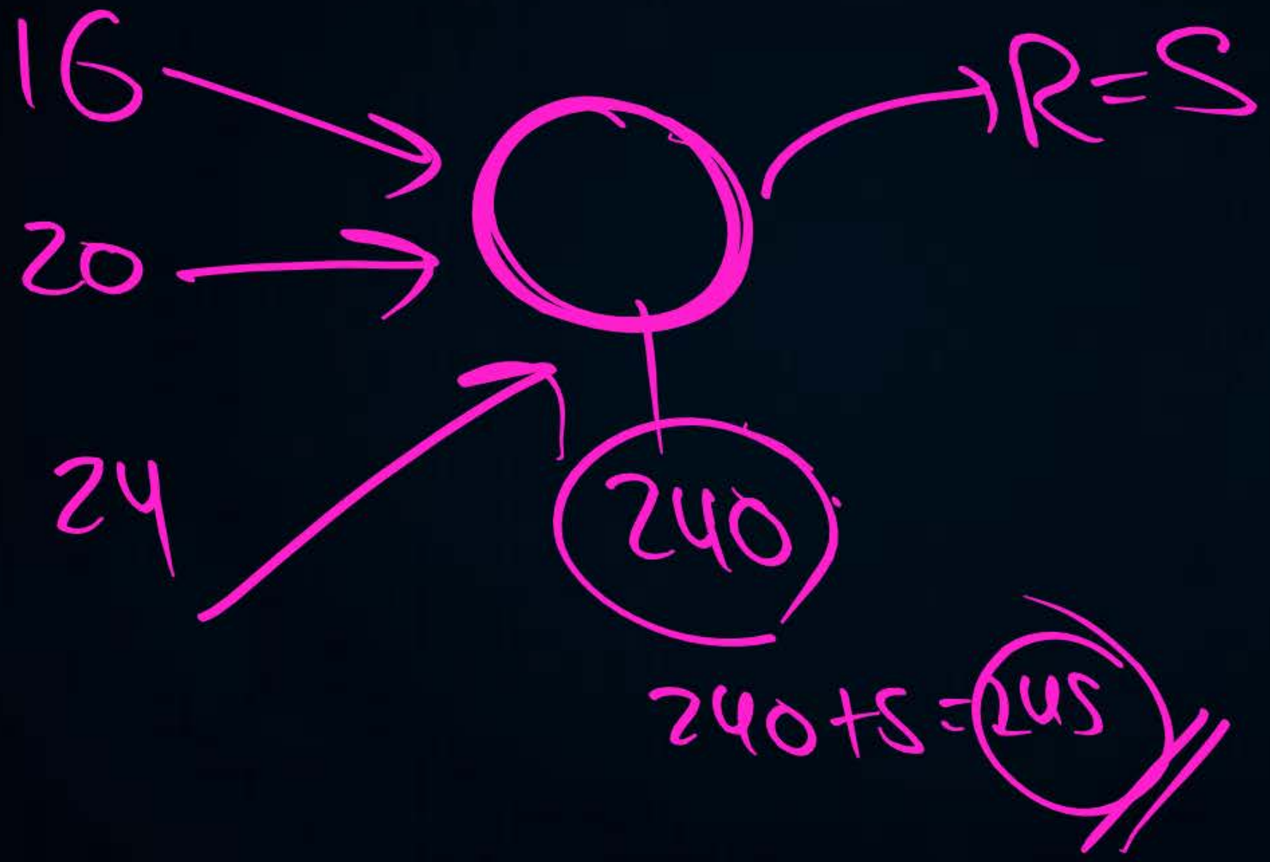
Topic : Real Number

#Q. Find the greatest number which can divide 1251, 9377 and 15628 leaving 1, 2 and 3, as remainder respectively.



Topic : Real Number

#Q. Find the smallest number which when divided by 16, 20 and 24 will leve a remainder 5 in each case.



Topic : Real Number

#Q. If two positive integers x and y are expressible in terms of primes as $x = p^2q^3$ and $y = p^3q$, what can you say about their LCM and HCF. Is LCM a multiple of HCF? Explain.

$x = p^2q^3$

$y = p^3q$.

$HCF = p^2q^1$

$LCM = p^3q^3$

Yes

HCF is always a factor of LCM.

LCM is a multiple of HCF.

Topic : Real Number

#Q. Prove that $\sqrt{3}$ is an irrational number.

Let $\sqrt{3}$ be rational.

$\therefore \sqrt{3} = \frac{p}{q}$ [where p and q are (coprime) integers]

2 nos jinka 1 key aawa koi or common factor nahi hoga.

Squaring...

$(\sqrt{3})^2 = \left(\frac{p}{q}\right)^2$

$3 = \frac{p^2}{q^2}$

$3q^2 = p^2$

3 divides p^2

$\Rightarrow$ 3 divides p. — (1)

let $3c = p$

$3q^2 = (3c)^2$

$3q^2 = 9c^2$

$q^2 = 3c^2$

3 divides q^2

$\Rightarrow$ 3 divides q. — (2)

From (1) and (2)

3 is also a comman factor of p and q.

$\therefore$ our assumption was wrong... $\therefore \sqrt{3}$ is irrational.

Topic : Real Number

#Q. Prove that $2 + 5\sqrt{3}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.

Let $2+5\sqrt{3}$ be rational.

$\therefore 2+5\sqrt{3} = \frac{p}{q}$ [p & q are coprime integers]

$5\sqrt{3} = \frac{p}{q} - 2$

$5\sqrt{3} = \frac{p-2q}{q}$

$\sqrt{3} = \frac{p-2q}{5q}$ I I

I = Rational

This is not possible...

Hence, Our assumption was wrong.

$\therefore$ $2+5\sqrt{3}$ is an irrational no.

Topic : Real Number

#Q. Prove that $\sqrt{2} + \sqrt{3}$ is irrational.

Let $\sqrt{2}+\sqrt{3}$ be rational.

$\therefore \sqrt{2}+\sqrt{3} = \frac{p}{q}$ [p and q coprime integers]

Squaring both sides :-

$(\sqrt{2}+\sqrt{3})^2 = \left(\frac{p}{q}\right)^2$

$(\sqrt{2})^2 + (\sqrt{3})^2 + 2\sqrt{2}\times\sqrt{3} = \frac{p^2}{q^2}$

$2+3+2\sqrt{6} = \frac{p^2}{q^2}$

$5+2\sqrt{6} = \frac{p^2}{q^2}$

$2\sqrt{6} = \frac{p^2}{q^2} - 5$

$2\sqrt{6} = \frac{p^2-5q^2}{q^2}$

$\sqrt{6} = \frac{p^2-5q^2}{2q^2}$

$\sqrt{6}$ is irrational

$\frac{p^2-5q^2}{2q^2}$ is rational

Irrational = Rational

For 2 positive integers. - -

a, b

$$HCF(a,b) \times LCM(a,b) = a \times b$$

Topic : Real Number

#Q. HCF of two number is 27 and their LCM is 162. If one of the numbers is 54, then other number is

A 36

B 35

C 9

D 81

HCF = 27

LCM = 162

HCF × LCM = product of two no.

$27 \times 162 = 54 \times x$

$\frac{27 \times 162}{54} = x$

$81 = x$

Topic : Real Number

#Q. On an evening walk, three people step off together and their steps measure 40 cm, 42 cm and 45 cm, respectively. How much minimum distance each should cover so that each can cover the same distance in complete steps?

2	40, 42, 45
2	20, 21, 45
2	10, 21, 45
5	5, 21, 45
3	1, 21, 9
3	1, 7, 3
7	1, 1, 1
	1, 1, 1

LCM = 2520 cm

Topic : Real Number

#Q. National Art convention got registrations from students from all parts of the country, of which 60 are interested in music, 84 are interested in dance and 108 students are interested in handicrafts. For optimum cultural exchange, organisers wish to keep them in minimum number of groups such that each group consists of students interested in the same artform and the number of students in each group is the same. Find the number of students in each group. Find the number of groups in each art form. How many rooms are required if each group will be allotted a room?

2	60
2	30
3	15
5	5
	1

2	84
2	42
3	21
7	7
	1

2	108
2	54
3	27
3	9
3	3
	1

$60 = 2^2 \times 3^1 \times 5^1 \times 7^0$

$84 = 2^2 \times 3^1 \times 7^1 \times 5^0$

$108 = 2^2 \times 3^3 \times 5^0 \times 7^0$

$HCF = 2^2 \times 3^1 \times 7^0 \times 5^0$

HCF = 12 Students.

$M = \frac{60}{12} = 5$ groups.

$D = \frac{84}{12} = 7$ groups

$H = \frac{108}{12} = 9$ groups

Total rooms $= 5 + 7 + 9$

$= 21$

Topic : Real Number

#Q. 4 bells ring together at 9.00 a.m. They ring after 7 seconds, 8 seconds, 11 seconds and 12 seconds respectively. How many times will they ring together again in the next 3 hours?

7S, 8S, 11S, 12S . . .

7	7, 8, 11, 12
2	1, 8, 11, 12
2	1, 4, 11, 6
2	1, 2, 11, 3
11	1, 1, 11, 3
3	1, 1, 1, 1, 3
	1, 1, 1, 1, 1

LCM = 1848 seconds.

1 min = 60 S

$\frac{1}{60}$ min = 1S

$1848 \times \frac{1}{60}$ min = 1848 S

$\frac{154}{5}$ min = 1848 seconds

1 hour = 60 min

3 hour = 180 min.

$= \frac{180}{\frac{154}{5}}$

$= \frac{180 \times 5}{154} = 5$.

Topic : Real Number

#Q. In a formula racing competition, the time taken by two racing cars A and B to complete 1 round of the track is 30 minutes and p minutes respectively. If the cars meet again at the starting point for the first time after 90 minutes and the H.C.F (30, p) = 15, then the value of p is

A 45 minutes

B 60 minutes

C 75 minutes

D 180 minutes

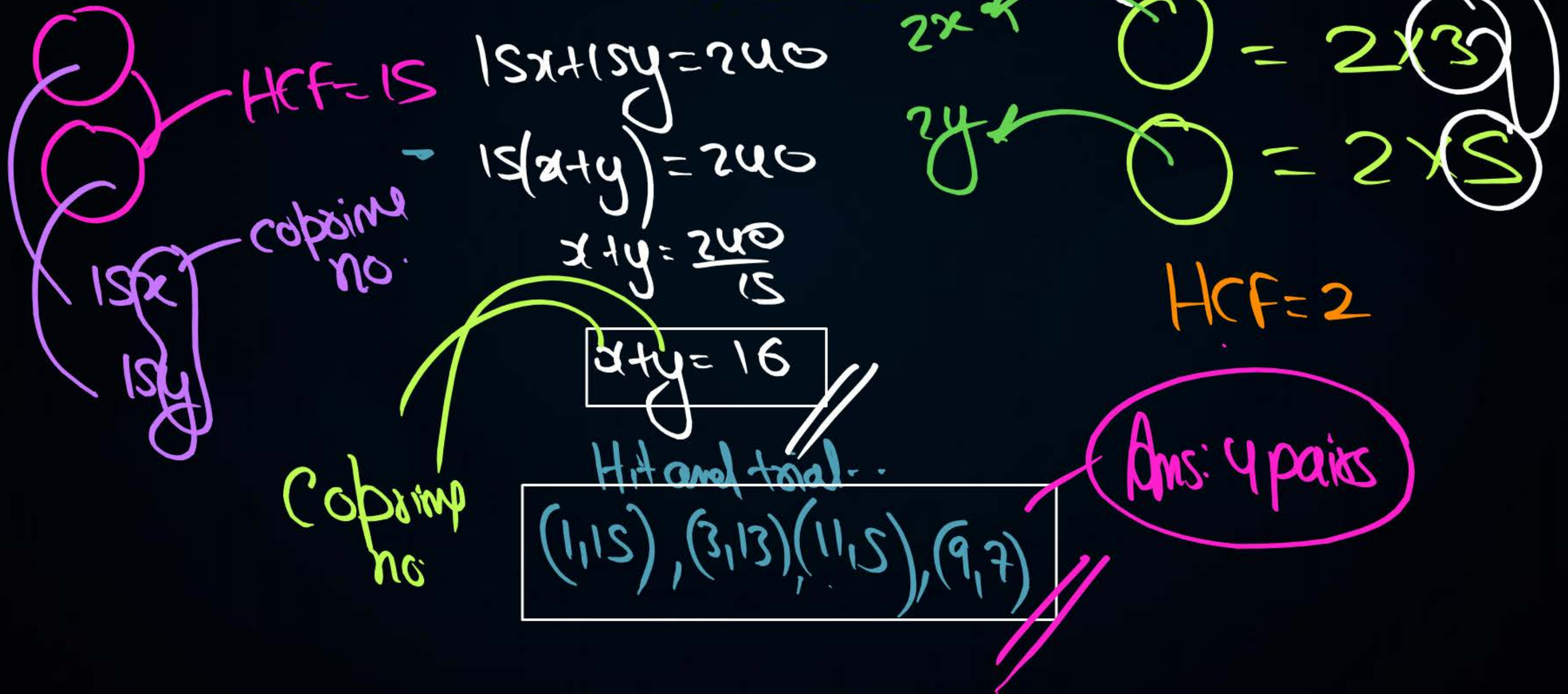
HCF × LCM = product

15 × 90 = 30 × p

$\frac{15}{\text{min}} = p$

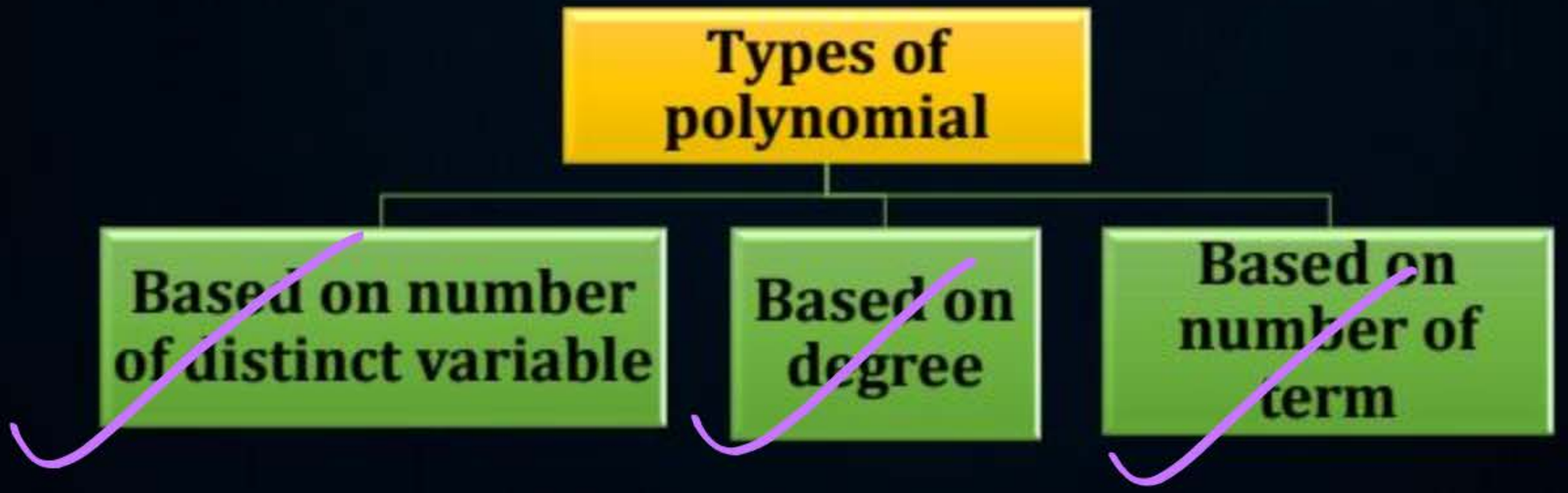
Topic : HCF and LCM

#Q. The sum of two positive numbers is 240 and their HCF is 15. Find he number of pairs of numbers satisfying the given condition.



Types of Polynomial

In general, the polynomial are divided into three categories.



degree = variable ki highest power ..

Degree	Name	Example
Not defined	Zero	0
0	(Non-zero) Constant	(any real number)
1	Linear	$x + 1$
2	Quadratic	$x^2 + x + 13$
3	Cubic	$x^3 + 2x - x + 4$

Generally, a polynomial of degree n, for n greater than 3, is called a polynomial of degree n, although quartic and quinto polynomial are sometimes used for degree 4and 5 respectively.

Based on Number of Terms

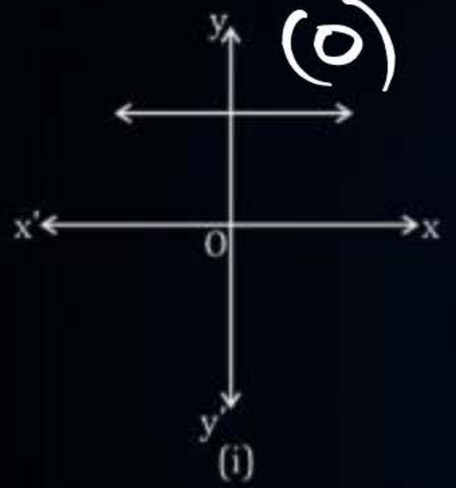
Number of non-zero term	Name	Example
1	Monomial	x^2
2	Binomial	$x^2 + 1$
3	Trinomial	$x^2 + x + 1$

Based on Number of Distinct Variables

Number of distinct variable	Name	Example
1	Univariate	$x + 3$
2	Bivariate	$x + y + 5$
3	Trivariate	$x + y + z + 7$

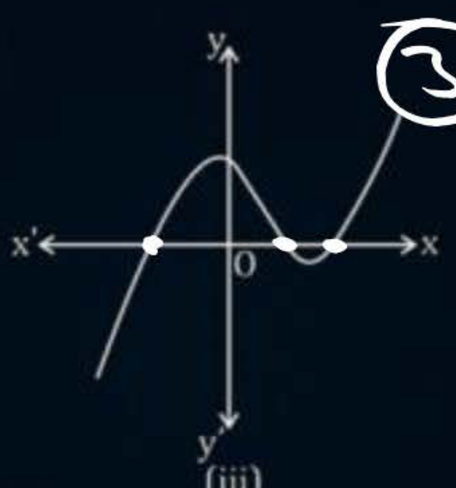
Topic : Polynomials

#Q. The graph of $y = p(x)$ are given in fig. below, for some polynomial $p(x)$. Find the number of zeroes of $p(x)$ in each case.

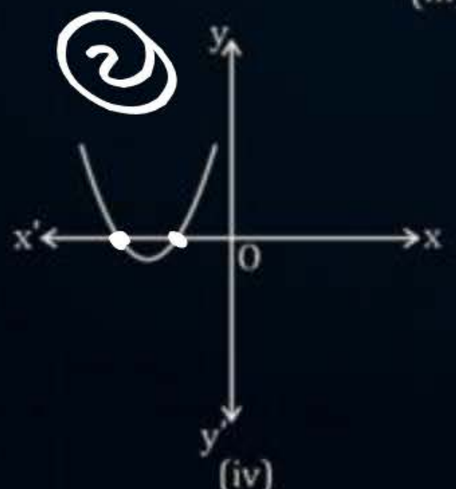


(i)

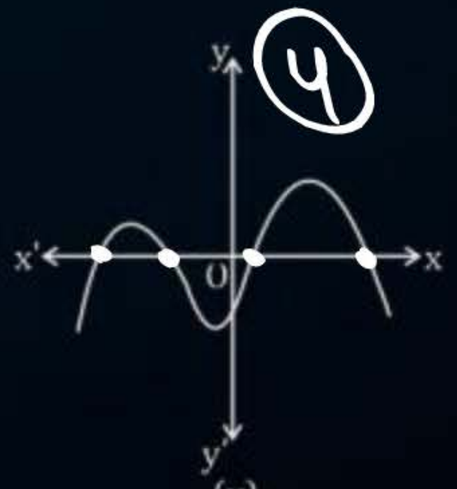
(ii)



(iii)



(iv)



(v)

(vi)

$x-2$

2 is a zero.

$x^2-4=0$

$x=2,-2$

zeroes

Topic : Polynomials

#Q. A polynomial of degree n has

(A) At least n zeroes

(B) Only one zero

(C) More than n zeroes

(D) Atmost n zeroes

d=100 → Maximum 100 zeroes.

How many zeroes?

Linear = d=1 → 1 → exactly one zero

Quadratic = d=2 → Maximum 2 zeroes.

Cubic = d=3 → Maximum 3 zeroes.

Quartic = d=4 → atmost 4 zeroes.

ax^2+bx+c
$a, b, c \in R$
$a \neq 0$

ax^2+bx+c → α, β

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

Sum of zeroes

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

Product of zeroes

Topic : Polynomials

#Q. Find the zeroes of the quadratic polynomial $9x^2 - 5$ and verify the relation between the zeroes and its coefficients.

$9x^2 - 5 = 0$

$9x^2 = 5$

$x^2 = \frac{5}{9}$

$x = \pm\sqrt{\frac{5}{9}}$

$x = \pm\frac{\sqrt{5}}{3}$

$x = +\frac{\sqrt{5}}{3}, -\frac{\sqrt{5}}{3}$

α β

$ax^2 + bx + c$

$9x^2 = 5 + 0x$

$a = 9, b = 0, c = -5$

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

$\frac{\sqrt{5}}{3} + -\frac{\sqrt{5}}{3} = -\frac{0}{9}$

$\frac{\sqrt{5} - \sqrt{5}}{3} = 0$

$0 = 0$

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

$\left(\frac{\sqrt{5}}{3}\right)\left(-\frac{\sqrt{5}}{3}\right) = -\frac{5}{9}$

$-\frac{5}{9} = -\frac{5}{9}$

Topic : Polynomials

$\neq (\alpha+\beta)^2$

#Q. If α, β are zeroes of quadratic polynomial $5x^2 + 5x + 1$ find the value of

(i) $\alpha^2 + \beta^2$

(ii) $\alpha^{-1} + \beta^{-1}$

ax^2+bx+c

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

$(a+b)^2 = a^2+b^2+2ab$

$(a+b)^2 - 2ab = a^2+b^2$

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

$\alpha+\beta = -\frac{5}{5}$

$\alpha+\beta = -1$

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

$\alpha\beta = \frac{1}{5}$

(i) $\alpha^2+\beta^2 = (\alpha+\beta)^2 - 2\alpha\beta$

$= (-1)^2 - 2\left(\frac{1}{5}\right)$

$= 1 - \frac{2}{5}$

$= \frac{3}{5}$

(ii) $\alpha^{-1}+\beta^{-1}$

$= \frac{1}{\alpha}+\frac{1}{\beta}$

$= \frac{\beta+\alpha}{\alpha\beta} = \frac{-1}{1/5} = \frac{-1}{\frac{1}{5}} = -5$

Topic : Polynomials

#Q. If α and β are the [redacted] (zeroes) of the polynomial $f(x) = x^2 - 3x + k$ such that $\alpha - \beta = 1$, find the value of k.

ax^2+bx+c

$a=1,\ b=-3,\ c=k.$

$\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta$

$\alpha-\beta=1$

$(\alpha-\beta)^2=(1)^2$

$\alpha^2+\beta^2-2\alpha\beta=1$

$(\alpha+\beta)^2-2\alpha\beta-2\alpha\beta=1$

$(\alpha+\beta)^2-4\alpha\beta=1$

$9-4k=1$

$9-1=4k$

$8=4k$

$2=k$

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

$\alpha+\beta=-\frac{(-3)}{1}$

$\alpha+\beta=3$

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

$\alpha\beta=k$

Topic : Polynomials

#Q. Find the value of p for which one zero of the quadratic equation $px^2 - 14x + 8$ is 6 times the other.

One zero is 6 times the other.

$\alpha = 6\beta$.

H.W

$a = p, b = -14, c = 8$

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

$\alpha + \beta = -\frac{(-14)}{p}$

$\alpha + \beta = \frac{14}{p}$

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

$\alpha\beta = \frac{8}{p}$

Q 2, -5

Sum(S) , product(P)

Sum = 2 + -5 = -3

Product = -2 × 5 = -10

Formula $k[x^2 - (\text{Sum})x + \text{product}]$

$= k[x^2 - (-3)x + -10]$

non zero Constant $= k[x^2 + 3x - 10]$

$= x^2 + 3x - 10$

Topic : Polynomials

#Q. Find a quadratic polynomial, the sum and product whose zeroes are $\sqrt{3}$ and $\frac{1}{\sqrt{3}}$ respectively.

Sum $= \sqrt{3}$

Product $= \frac{1}{\sqrt{3}}$

$= k[x^2 - Sx + P]$

$= k\left[x^2 - \frac{\sqrt{3}}{1}x + \frac{1}{\sqrt{3}}\right]$

$= k\left[\frac{\sqrt{3}x^2 - 3x + 1}{\sqrt{3}}\right]$

$= \frac{k}{\sqrt{3}}\left[\sqrt{3}x^2 - 3x + 1\right]$

$k = \sqrt{3}$

$\sqrt{3}x^2 - 3x + 1$

Topic : Polynomials

#Q. If one zero of the polynomial $p(x) = 6x^2 + 37x - (k - 2)$ is reciprocal of the other, then find the value of k.

Let α and $\frac{1}{\alpha}$

$a=6,\ b=37,\ c=-(k-2)$

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

$\alpha+\beta=-\frac{37}{6}$

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

$\alpha\beta=-\frac{(k-2)}{6}$

$\alpha \times \frac{1}{\alpha}=-\frac{k+2}{6}$

$1=-\frac{k+2}{6}$

$6=-k+2$

$k=-4$

Topic : Polynomials

#Q. If α and β are the zeroes of the polynomial $x^2 + 4x + 3$, form the polynomial whose zeroes are $1 + \frac{\beta}{\alpha}$ and $1 + \frac{\alpha}{\beta}$.

$$\text{Sum} = 1 + \frac{\beta}{\alpha} + 1 + \frac{\alpha}{\beta}$$

$$= 2 + \frac{\beta}{\alpha} + \frac{\alpha}{\beta}$$

$$= 2 + \frac{\beta^2 + \alpha^2}{\alpha\beta}$$

$$= 2 + \frac{(\alpha+\beta)^2 - 2\alpha\beta}{\alpha\beta}$$

$$\text{Sum} = 2 + \frac{(-4)^2 - 2(3)}{3}$$

$$\text{Sum} = 2 + \frac{16-6}{3}$$

$$= 2 + \frac{10}{3}$$

$$\text{Sum} = \frac{16}{3}$$

$x^2 + 4x + 3$

$a = 1,\ b = 4,\ c = 3$

$\alpha + \beta = -\frac{b}{a}$ | $\alpha\beta = \frac{c}{a}$

$\alpha + \beta = -4$ | $\alpha\beta = 3$

$$\text{Product} = \left(1+\frac{\beta}{\alpha}\right)\left(1+\frac{\alpha}{\beta}\right)$$

$$= 1\left(1+\frac{\alpha}{\beta}\right)+\frac{\beta}{\alpha}\left(1+\frac{\alpha}{\beta}\right)$$

$$= 1+\frac{\alpha}{\beta}+\frac{\beta}{\alpha}+\frac{\beta\alpha}{\alpha\beta}\,1$$

$$= 2+\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$$

$$= 2+\frac{\alpha^2+\beta^2}{\alpha\beta}$$

$\frac{16}{3}$

$\text{Sum} = \frac{16}{3}$, $P = \frac{16}{3}$

$$= k\left[x^2-\frac{16}{3}x+\frac{16}{3}\right]$$

$$= \frac{k}{3}\left[3x^2-16x+16\right]$$

$k=3$

$$= 3x^2-16x+16$$

$a_1x + b_1y + c_1 = 0$

$a_2x + b_2y + c_2 = 0$

$3x + 5y - 6 = 0$

$4x - 9y + 9 = 0$ → Solution → Variable ki aisi value jo eqn ko satisfy. L.H.S = R.H.S

Consistent

Unique solution.

Intersecting.

(coordinates) ↑ Solution.

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

Infinitely many solution.

Coincident.

dependent

$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

$\frac{3}{4} \neq \frac{5}{-9}$ $-\frac{6}{9}$

No solution.

inconsistent

Parallel.

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Topic : Pair of linear equations in two variables

#Q. Solve by elimination : $3x = y + 5, 5x - y = 11$.

$3x - y = 5$

$5x - y = 11$

$\ominus \quad \oplus \quad \ominus$

$(-)$

$-2x = -6$

$x = 3$

$3x - y = 5$

$3(3) - y = 5$

$9 - y = 5$

$4 = y$

Topic : Pair of linear equations in two variables

#Q. Solve by elimination: $3x - y = 7, 2x + 5y + 1 = 0$.

$2x(3x - y = 7)$

$3x(2x + 5y = -1)$

$6x - 2y = 14$

$6x + 15y = -3$

$-17y = 17$

$y = -1$

$3x - y = 7$

$3x - (-1) = 7$

$3x = 6$

$x = 2$

Topic : Pair of linear equations in two variables

#Q. The value of k for which the system of linear equations $x + 2y = 3$, $5x + ky + 7 = 0$ is inconsistent is

→ No solution.

$x + 2y = 3$

$5x + ky + 7 = 0$

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

$\frac{1}{5} = \frac{2}{k} \neq \frac{-3}{7}$

$\frac{1}{5} = \frac{2}{k}$

$k = 10$

$\frac{1}{5} = \frac{2}{10} \neq \frac{-3}{7}$

$\frac{1}{5} = \frac{1}{5} \neq \frac{-3}{7}$

A. -14/3

B. 2/5

C. 5

D. 10 ✓

Topic : Pair of linear equations in two variables

#Q. Find the value of k for which the following pair of linear equations have infinitely many solutions.

$2x + 3y = 7, (k + 1)x + (2k - 1)y = 4k + 1.$

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$

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

$$\frac{2}{k+1} = \frac{3}{2k-1}$$

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

$$4k-2 = 3k+3$$

$$4k-3k = 3+2$$

$$k = 5$$

Topic : Pair of linear equations in two variables

#Q. The sum of the digits of a two digit number is 8 and the difference between the number and that formed by reversing the digits is 18. Find the number.

$x+y=8$ — (1)

Number − Reversed no. = 18

$(10y+x)-(10x+y)=18$

$10y+x-10x-y=18$

$9y-9x=18$

$9(y-x)=18$

$y-x=2$ — (2)

$x+y=8$

$-x+y=2$

Unit's digit = x

Ten's digit = y

Two digit no. (no.) = $10y+x$

Reversed no. = $10x+y$

Topic : Pair of linear equations in two variables

#Q. The values of x and y satisfying the two equations: $32x + 33y = 34, 33x + 32y = 31$ respectively are

(A) -1, 2

(B) -1, 4

(C) 1, -2

(D) -1, -4

Add

$$32x + 33y = 34$$
$$33x + 32y = 31$$
$$65x + 65y = 65$$
$$65(x+y) = 65$$
$$x + y = 1 \quad -(1)$$

Subtract

$$32x + 33y = 34$$
$$33x + 32y = 31$$
$$-x + y = 3 \quad -(2)$$

Topic : Pair of linear equations in two variables

#Q. Determine graphically the coordinates of the vertices of a triangle, the equations of whose sides are given by $2y - x = 8$, $5y - x = 14$ and $y - 2x = 1$.

$2y - x = 8$

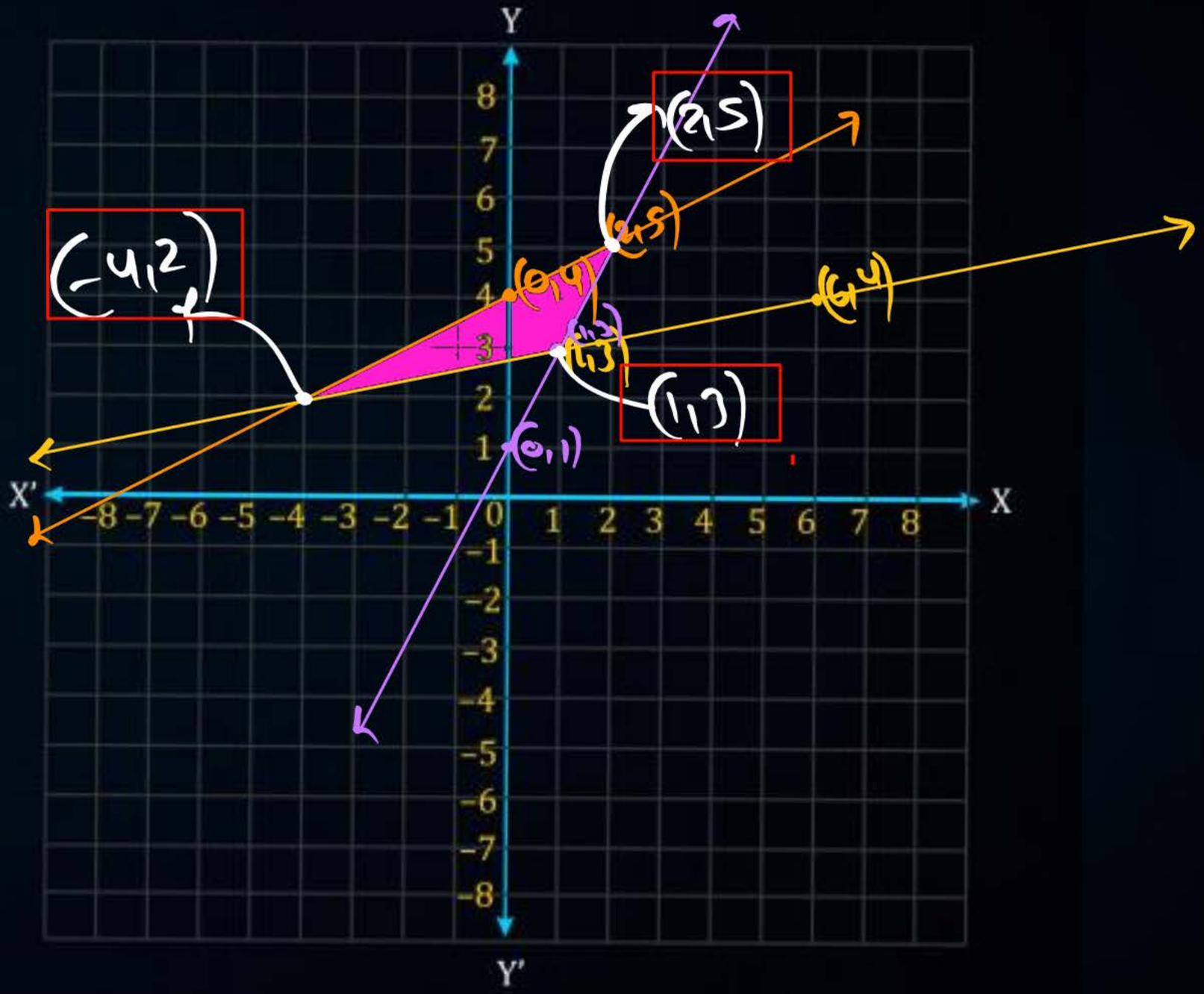
x	0	-8	2
y	4	0	5

$5y - x = 14$

x	1	-9	6
y	3	1	4

$y - 2x = 1$

x	0	1
y	1	3


Y
Y'
X
X'
(2,5)
(-4,2)
(4,5)
(0,4)
(6,4)
(1,3)
(1,1)
(0,1)

CASE BASED

A book store shopkeeper gives books on rent for reading. He has variety of books in his store related to fiction, stories and quizzes etc. He takes a fixed charge for the first two days and an additional charge for subsequent day. Amruta paid Rs. 22 for a book and kept for 6 days; while Radhika paid Rs. 16 for keeping the book for 4 days.

Fixed charge for 2 days = x Rs

additional charge = y Rs.

Assume that the fixed charge be Rs. X and additional charge (per day) be Rs. Y
Based on the above information, answer any four of the following question.

Topic : Pair of linear equations in two variables

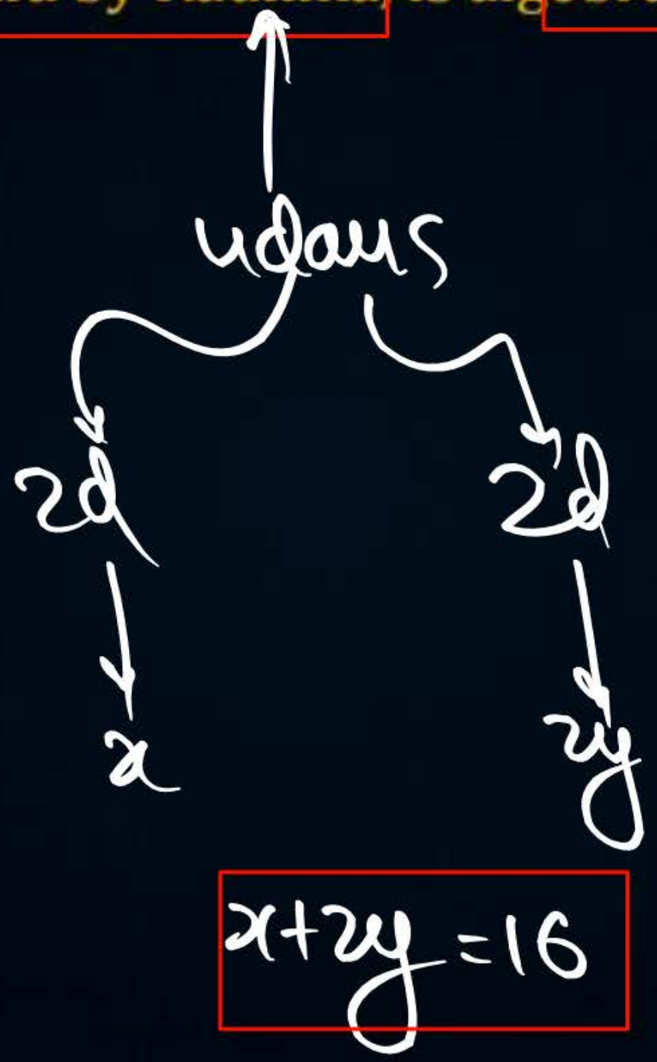
#Q. The situation of amount paid by Radhika, is algebraically represented by

A $x - 4y = 16$

B $x + 4y = 16$

C $x - 2y = 16$

D $x + 2y = 16$



Topic : Pair of linear equations in two variables

#Q. The situation of amount paid by Amruta, is algebraically represented by

(A) $x - 2y = 11$

(B) $x - 2y = 22$

(C) $x + 4y = 22$

(D) $x - 4y = 11$

Topic : Pair of linear equations in two variables

#Q. What are the fixed charges for a book?

A Rs. 9

B Rs. 10

C Rs. 13

D Rs. 15

$x + 2y = 16$

$x + 4y = 22$

$-2y = -6$

$y = 3$

$x + 2y = 16$

$x + 2(3) = 16$

$x = 10$

Topic : Pair of linear equations in two variables

#Q. What are the additional charge for each subsequent day for a book?

A Rs. 6

B Rs. 5

C Rs. 4

D Rs. 3

Topic : Pair of linear equations in two variables

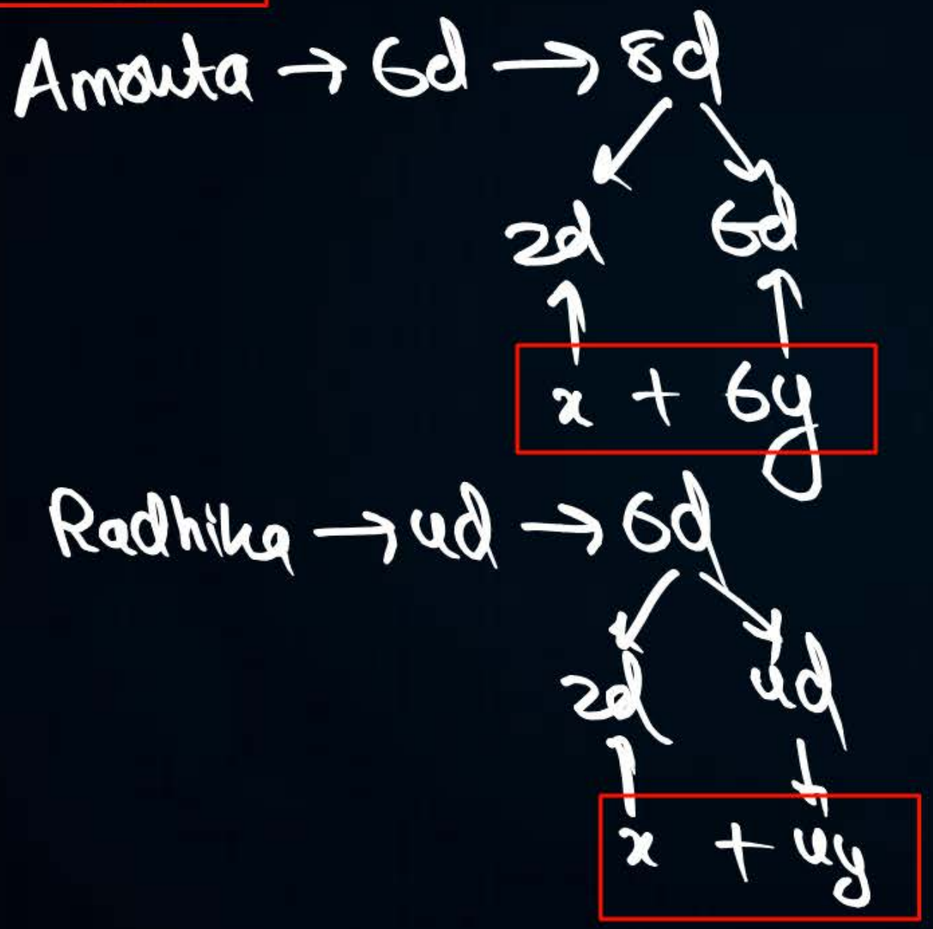
#Q. What is the total amount paid by both, if both of them have kept the book for 2 more days?

A Rs. 35

B Rs. 52

C Rs. 50

D Rs. 58



$= x+6y + x+4y$

$= 2x+10y$

$= 2(10)+10(3)$

$= 20+30$

$= 50$

Topic : Pair of linear equations in two variables

#Q. Aruna has only ₹ 1 and ₹ 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹ 75, then the number of ₹ 1 and ₹ 2 coins are, respectively

(A) 35 and 15

(B) 35 and 20

(C) 15 and 35

(D) 25 and 25 ✓

no of coins of ₹1 = x.

no. of coins of ₹2 = y.

$x + y = 50$

total coins.

$1x + 2y = 75$

1 → 1 → 1 Rs

2 → (1×2)

50 → (1×50)

x → (1×x) Rs

no of note | Total.

So → 1 → 50 Rs

So → 3 → (50×3)

So → 10 → (50×10)

So → 100 → (50×100)

So → x → (50×x)

2 → 4 → (2×4) Rs

2 → 10 → (2×10) Rs

2 → y → (2×y) Rs

$x + y = 50$ ①

$x + 2y = 75$ ②

$-y = -25$

$y = 25$

$\Rightarrow x = 25$

Topic : Pair of linear equations in two variables

#Q. If 2 is subtracted from the numerator and 1 is added to the denominator, a fraction becomes 1/2 but when 4 is added to the numerator and 3 is subtracted from the denominator, it becomes 3/2, then find the fraction:

A. 12/11

B. 8/11

C. 7/11

D. 13/13

$2x-3y=-17$

$2x-y=5$

$-2y=-22$

$y=11$

$2x-3y=-17$

$2x-33=-17$

$2x=16$

$x=8$

$N=x+4$ $\quad D=y-3$

$\frac{3}{2}=\frac{x+4}{y-3}$

$3(y-3)=2(x+4)$

$3y-9=2x+8$

$-17=2x-3y$ — (1)

$N=x-2$ $\quad D=y+1$

$\frac{1}{2}=\frac{x-2}{y+1}$

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

$y+1=2x-4$

$5=2x-y$ — (2)

$N=x$ $\quad D=y$

$F=\frac{x}{y}$

Topic : Pair of linear equations in two variables

#Q. In a competitive examination, one mark is awarded for each correct answer while 1/2 mark is deducted for every wrong answer. Jayanti answered 120 questions and got 90 marks. How many questions did she answer correctly?

Topic : Pair of linear equations in two variables

#Q. There are some students in the two examination halls A and B. To make the number of students equal in each hall, 10 students are sent from A to B. But if 20 students are sent from B to A, the number of students in A becomes double the number of students in B. Find the number of students in the two halls.

Topic : Pair of linear equations in two variables

#Q. The present age of a father is three years more than three times the age of his son. Three years hence the father's age will be 10 years more than twice the age of the son. Determine their present ages.

$x = 3 + 3(y)$ — ①

$x + 3 = 10 + 2(y + 3)$ — ②

$x + 3 = 10 + 2y + 6$

$x - 2y = 13$

	Pa.	Po.	Fu.
Father	—	x	$x+3$
Son	—	y	$y+3$

Comment Box

THANK YOU