CBSE Class 10 Maths Important Questions and Answers for 2023

MULTIPLE CHOICE QUESTIONS

Q1. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is

a) 10 b) -10 c) 5 d) -5

Q2. A quadratic polynomial, the sum of whose zeros is 2 and one zero is 3 is

a) $x2-9$ b) $x2+9$ c) $x2+3$ d) $x2-3$

Q3. A quadratic polynomial, the sum of whose zeros is -5 and their product is 6 is

a) $x^2 + 5x + 6$ b) $x^2 + 5x + 6$ c) $x^2 - 5x + 6$ d) $-x^2 + 5x + 6$

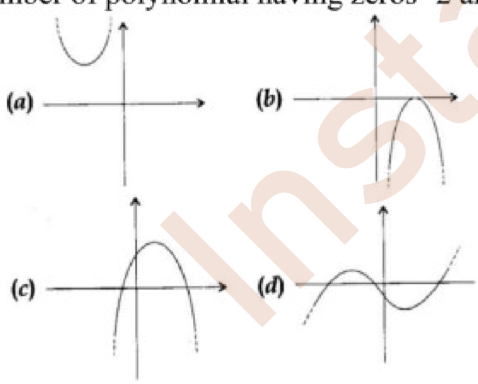
Q4. If one zero of the polynomial $f(x) = (k^2 + 4)x^2 + 13x + 4k$ is the reciprocal of the other, then k =

a) 2 b) -2 c) 1 d) -1

Q5. If ∝ , β are the zeros of the polynomial $f(x) = x^2 + x + 1$, then $\frac{1}{\alpha} + \frac{1}{\beta} =$

a) 1 b) -1 c) 0 d) None of these

Q6. The number of polynomial having zeros -2 and 5 is



a) 1 b) 2 c) 3 d) More than 3

OBJECTIVE TYPE QUESTIONS (I MARK QUESTIONS)

Q1. Write the zeros of the polynomial $x^2 - x - 6$

Q2. Write a polynomial whose zeros are (2+√3) and (2 − √3)

Q3. If α, β are the zeros of the polynomial, such that α+β=6 and α β=4, then write the polynomial.

Q4. If α and 1/α are the zeros of the polynomial $4x^2 - 2x + (k - 4)$, find the value of k .

Q5. Check whether -2 is a zero of the polynomial $9x^3 - 18x^2 - x - 2$

SHORT ANSWER TYPE QUESTIONS (2 MARKS QUESTIONS)

Q1. Find the zeroes of the polynomial $2x^2 - 9$ and verify the relationship between zeros and coeffients.

Q2. Find a quadratic polynomial the sum and product of whose zeros are 3 and -2/5

respectively.

Q3. If α and β are zeros of $3x^2 + 5x + 13$,then find the value of 1/α + 1/β

Q4. Check whether x = −3 is a zero of $x^3 + 11x^2 + 23x - 35$.

Q5. Find p and q if p and q are the zeros of the quadratic polynomial $x^2 + px + q$.

SHORT ANSWER TYPE QUESTIONS(3 MARKS)

Q1. Find the zeroes of the following polynomial by factorisation method and verify the relations between the zeroes and their coefficients

i) $7y^2 - \frac{11}{3}y - \frac{2}{3}$

ii) $\sqrt{3}x^2 + 10x + 7\sqrt{3}$

iii)$4\sqrt{3}x^2 + 5x - 2\sqrt{3}$

Q2. If the sum of the zeroes of the polynomial $p(x) = (a+1)x^2 + (2a+3)x + (3a+4)$ is -1, then find the product of the zeroes.

Q3. If (x + a) is a factor of two polynomials $x^2 + px + q$ and $x^2 + mx + n$, then prove that $a = \frac{n-p}{m-P}$

Q4. Can the quadratic polynomial $x^2 + kx + k$ have equal zeroes for some odd integer k > 1?

Q5. If one zero of a polynomial $3x^2 - 8x + 2k + 1$ is seven times the other, find the value of k.

LONG ANSWER TYPE QUESTIONS(4 MARKS)

Q1. If α and β are the zeroes of the quadratic polynomial $p(s) = 3s^2 - 6s + 4$, find the value of

$$\frac{\alpha}{\beta} + \frac{\beta}{\alpha} + 2\left(\frac{1}{\alpha} + \frac{1}{\beta}\right) + 3\alpha\beta$$

Q2. If the squared difference of the zeroes of the quadratic polynomial $f(x) = x^2 + px + 45$ is equal to 144, find the value of p.

Q3. If α and β are the roots of the equation $ax^2+bx+c=0$ and if $px^2+qx+r=0$ has roots $\frac{1-\alpha}{\alpha}$ and $\frac{1-\beta}{\beta}$, then r is

Q4. If a and b are the zeroes of the quadratic polynomial $f(x)=x^2-px+q$, prove that

$$\frac{a^2}{b^2} + \frac{b^2}{a^2} = \frac{p^4}{q^2} - \frac{4p^2}{q} + 2.$$

Q5. If l and m are zeroes of the polynomial $p(x)=2x^2-5x+7$, find a polynomial whose zeroes are 2l+3 and 2m+3.

To check your preparation level for the upcoming class 10th board exam, attempt the practise papers for CBSE class 10 below:

These practise papers have been prepared by subject experts, especially incorporating the modifications and updates in the latest syllabus by CBSE.

ANSWERS

MULTIPLE CHOICE QUESTIONS

1 (b) Since 2 is zero P(2)=0 $P(2) = 2^2 + 3x2 + k = 0$ which gives $k = -10$

2

(a) Given $\alpha + \beta = 0 \quad \alpha = 3 \ so\ \beta = -3$

$$p(x) = k(x^2 - (\alpha+\beta)x + \alpha\beta)$$
$$p(x) = k(x^2 - 9)$$

3

(a)

$$P(x) = k(x^2 - (-5x) + 6)$$
$$P(x) = k(x^2 + 5x + 6)$$
$$when\ k = 1\ p(x) = x^2 + 5x + 6$$

4

(a) Let the zeros be α , $\frac{1}{\alpha}$

So $\alpha\ X \frac{1}{\alpha} = 1 = \frac{4k}{k^2+4}$

cross multiplying we get $k^2 - 4k + 4 = 0 \Rightarrow (k-2)^2 = 0$ which gives k = 2

5

(b) $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha+\beta}{\alpha\beta} = \frac{-1}{1} = -1 \quad \{\alpha + \beta = -1\ and\ \alpha\beta = 1\}$

6

(d)

$$P(x) = k(x^2 - (-2+5)x + -2\ X\ 5) = k(x^2 = 3x - 10)$$

Since k can take infinite number of values, there can be more than three polynomials.

OBJECTIVE TYPE QUESTIONS (I MARK QUESTIONS)

Q1. $X^2 - x - 6 = (x - 3)(x + 2)$ so the zeros are 3 and −2

Q2. $= K(x^2 - (\alpha + \beta)x + \alpha\beta)$

$= K(x^2 - (2 + \sqrt{3} + 2 - \sqrt{3})x + (2 + \sqrt{3})(2 - \sqrt{3}))$

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

$= K(x^2 - 4x + (4 - 3))$

$= K(x^2 - 4x + 1)$

Q3. $P(x) = K (x^2 - (\alpha + \beta)x + \alpha\beta) = K(x^2 - 6x + 4)$

Q4.

Given $\alpha, \frac{1}{\alpha}$ are the zeros of the polynomial. Product of the zeros $= \frac{c}{a} = \frac{k-4}{4}$

$$\alpha\ X \frac{1}{\alpha} = \frac{k-4}{4}$$

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

Cross multiplying we get k = 8

Q5.

$f(x) = 9x^3 - 18x^2 - x - 2$ If -2 is a zero then $f(-2) = 0$

$$f(-2) = 9X((-2)^3 + 18X(-2)^2 - (-2) - 2$$
$$= 9\,X(-8) + 18\,X\,(4) + 2 - 2$$
$$= -72 + 72 + 2 - 2 = 0$$

Since $f(-2) = 0$ -2 is a zero of the given polynomial.

SHORT ANSWER TYPE QUESTIONS (2 MARKS QUESTIONS)

Q1. ± 3/√2

Q2. $x^2 - 15x - 2$

Q3. − 5/13

Q4. x= -3 is not a zero

Q5. 5 p = 1; q = −2

SHORT ANSWER TYPE QUESTIONS(3 MARKS)

1 i) y = 14/21, − 1/7

ii) x = −√3 , −7/√3

iii) x = − 2/√3, 3/ 4√3⁄2

2 Product = -2

3 Correct proof

4 The quadratic polynomial cannot have equal zeros for any odd integer k > 1

5 k = − 1/9

LONG ANSWER TYPE QUESTIONS(4 MARKS)

1

Sum of zeroes = $\alpha+\beta = \frac{-b}{a} = -(\frac{-6}{3}) = 2$ ....(i)

Product of zeroes = $\alpha\beta = \frac{c}{a} = \frac{4}{3}$ -..............(ii)

Now, $\frac{\alpha}{\beta} + \frac{\beta}{\alpha} + 2\,(\frac{1}{\alpha} + \frac{1}{\beta}) + 3\,\alpha\beta = \frac{\alpha^2+\beta^2}{\alpha\beta} + 2\,(\frac{\alpha+\beta}{\alpha\beta}) + 3\,\alpha\beta$

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

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

$$= 1 + 3 + 4 = 8$$

2

$f(x) = x^2+px+45$

Sum of zeroes = $\alpha+\beta = \frac{-b}{a} = -p$ (i)

Product of zeroes = $\alpha\beta = \frac{c}{a} = 45$…(ii)

Given $(\alpha - \beta)^2 = 144$

$(\alpha+\beta)^2 - 4\alpha\beta = 144$

$(-p)^2 - 4(45) = 14$

$P^2 = 144 + 180 = 3$

$P = \sqrt{324} = 18$

3

Since α and β are the roots of the equation $ax^2 + bx + c = 0$, so,

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

The equation with roots $\frac{1-\alpha}{\alpha}$ and $\frac{1-\beta}{\beta}$ can be written as

$x^2 - \{\frac{1-\alpha}{\alpha} + \frac{1-\beta}{\beta}\}x + \{\frac{1-\alpha}{\alpha} * \frac{1-\beta}{\beta}\} = 0$ ………………… 1

Now, sum of zeroes , $\{\frac{1-\alpha}{\alpha} + \frac{1-\beta}{\beta}\} = \frac{\alpha+\beta-2\alpha\beta}{\alpha\beta}$

$= \frac{\alpha+\beta}{\alpha\beta} + \frac{-2\alpha\beta}{\alpha\beta} = \frac{\alpha+\beta}{\alpha\beta} - 2$, ……………………………………...2

$= \frac{-b}{c} - 2 = \frac{-b-2c}{c}$, since $\alpha + \beta = \frac{-b}{a}, \alpha\beta = \frac{c}{a}$

Product of zeroes

$\frac{1-\alpha}{\alpha} * \frac{1-\beta}{\beta} = \frac{1-(\alpha+\beta)+\alpha\beta}{\alpha\beta} = \frac{1-\frac{-b}{a}+\frac{c}{a}}{\frac{c}{a}} = \frac{a+b+c}{c}$ …………………….3

Putting 2 and 3 in 1

The required equation is $x^2 - \{\frac{-b-2c}{c}\}x + \frac{a+b+c}{c} = 0$

$cx^2 + (b + 2c)x + (a + b + c) = 0$ —- (i)

On comparing equation (i) with the equation given $px^2 + qx + r = 0$, $r = a + b + c$.

4

Sum of zeroes = $a + b = p$

Product of zeroes = $ab = q$

$$\frac{a^2}{b^2} + \frac{b^2}{a^2} = \frac{a^4 + b^4}{a^2b^2} = \frac{(a^2 + b^2)^2 - 2a^2b^2}{a^2b^2}$$

$$= \frac{[(a+b)^2 - 2ab]^2 - 2a^2b^2}{a^2b^2} = \frac{[p^2 - 2q]^2 - 2q^2}{q^2}$$

$$= \frac{p^4 - 4p^2q + 4q^2 - 2q^2}{q^2} = \frac{p^4 - 4p^2q + 2q^2}{q^2}$$

$$= \frac{p^4}{q^2} - \frac{-4p^2q}{q^2} + \frac{2q^2}{q^2}$$

$$= \frac{p^4}{q^2} - \frac{-4p^2q}{q^2} + 2$$

5

$l + m = \frac{5}{2}$

$lm = \frac{7}{2}$

a polynomial whose zeroes are $2l + 3$ *and* $2m + 3$ is

$x^2 - (2l + 3 + 2m + 3)x + (2l + 3)(2m + 3)$

$= x^2 - [2(l + m) + 6)]x + (4lm + 6(l + m) + 9)$

$= x^2 - 5x + 6x + 14 + 15 + 9$

$= x^2 + x + 38$

All the best!

CBSE Class 10 Maths Important Questions with Answers

MULTIPLE CHOICE QUESTIONS

Q1. The pair of linear equations 3x + 5y = 3 and 6x + ky = 8 do not have a solution if k

a) = 5 b) = 10 c) ≠10 d) ≠ 5

Q2. The solution of the equation x + y = 5 and x − y = 5 is

a) (0,5) b) (5,5) c) (5,0) d) (10 ,5)

Q3. The pair of linear equations x = 0 , x = −5 has

a) One solution b) two solution c) infinite no: of solution d) no solution

Q4. For what value of ‘k’ do the equations 3x – y + 8 = 0 and 6x – ky + 16 = 0 represent coincident lines

a) 1/2 b) −1/2 c) 2 d) -2

Q5. The value of ‘k’ for which the system of equations 4x + ky + 8 = 0 and 2x + 2y + 2 = 0 has a unique solution is 35

a) k=3 b) k ≠ 4 c) k ≠ 0 d) k=0

OBJECTIVE TYPE QUESTIONS

Q1. In how many points do the lines represented by the equations x − y = 0 and x + y = 0

intersect?

Q2. Find the value of (x + y)if , 3x − 2y = 5 and 3y − 2x = 3

Q3. Sum of two numbers is 35 and their difference is 13, find the numbers

Q4. Find the value of ‘p’ for which the pair of linear equations 2px + 3y = 7: 2x + y = 6 has exactly one solution

Q5. Do the equations y = x and y = x + 3 represent parallel lines?

CASE STUDY BASED QUESTIONS

The alumni meet of two batches of a college- batch A & batch B were held on the same day in the same hotel in two separate halls “Rose” and “Jasmine”. The rents were the same for both the halls. The expense for each hall is equal to the fixed rent of each hall and proportional to the number of persons attending each meet. 50 persons attended the meet in “Rose” hall, and the organisers had to pay ₹ 10000 towards the hotel charges. 25 guests attended the meet in “Jasmine” hall and the organisers had to pay ₹ 7500 towards the hotel charges. Denote the fixed rent by ₹ x and proportional expense per person by ₹ y.

1. Represent algebraically the situation in hall “Rose”.

a) $50x + y = 10000$

b) $50x - y = 10000$

c) $x + 50y = 10000$

d) $x - 50y = 10000$

2. Represent algebraically the situation in hall “Jasmine”

a) $x + 25y = 7500$

b) $x - 25y = 7500$

c) $25x + y = 7500$

d) $25x - y = 7500$

3. What is the fixed rent of the halls?

a) ₹2500

b) ₹3300

c) ₹ 4000

d) ₹5000

4. Find the amount the hotel charged per person.

a) ₹ 150

b) ₹ 190

c) ₹130

d) ₹ 100

SHORT ANSWER TYPE QUESTIONS (2 MARKS)

Q 1. Find the solutions of the pair of linear equations $5x + 10y – 50 = 0$ and $x + 8y = 10$. Hence find the value of m if $y = mx + 5$.

Q 2. Are the following pair of linear equations consistent? Justify your answer.

$2ax + by = a; 4ax + 2by – 2a = 0 ; a , b \neq 0$

Q 3. There are 20 vehicles – cars and motorcycles in a parking area. If there are 56 wheels together, how many cars and motorcycles are there?

Q 4. Write a pair of linear equations which has a unique solution $x = 2$ and $y = -1$. How many such pairs are possible?

Q 5. If the sum of two positive numbers is 108 and the difference of these numbers is 8, then find the numbers.

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

Q1. Find the two-digit numbers whose sum is 75 and difference is 15

Q2. The monthly incomes of A and B are in the ratio 5:4 and their expenditure are in the ratio 7:5. If each saves 3000/- per month, find the monthly income of each.

Q3. A and B each have a certain number of oranges. A says to B, "if you give me 10 of your oranges, I will have twice the number of oranges left with you." B replies," if you give me 10 of your oranges, I will have the same number of oranges as left with you. Find the number of oranges with A and B separately.

Q4. Yash scored 40 marks in a test, receiving 3 marks for each correct answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each wrong answer, then Yash would have scored 50 marks. How many questions were there in the test?

Q5. A man has only 20 paisa coins and 25 paisa coins in his purse. If he has 50 coins in all totalling 11.25/-, how many coins of each kind does he have?

LONG ANSWER TYPE QUESTIONS (4 Marks)

Q1. Two numbers are in the ratio 5:6. If 8 is subtracted from each of the numbers, the ratio becomes 4:5. Find the numbers.

Q2. The age of the father is twice the sum of the ages of his two children. After 20 years, his age will be equal to the sum of the ages of his children. Find the age of the father.

Q3. A number consists of two digits. When the number is divided by the sum of its digits, the quotient is 7. If 27 is subtracted from the number, the digits interchange their places. Find the number.

Q4. Draw the graphs of $2x - 3y + 6 = 0$ and $2x + 3y - 18 = 0$. Find the ratio of areas of triangles formed by the given lines with X-axis and Y-axis.

Q5. Determine graphically the vertices of the triangle, the equations of whose sides are given below

$2y - x = 8$; $5y - x = 14$; $y - 2x = 1$

ANSWER KEY

Q no	MULTIPLE CHOICE QUESTIONS
1	b

2 c

3 d

4 c

5 b

Q no OBJECTIVE TYPE QUESTIONS

1 one

2 X + Y = 8

3 24, 11

4 P ≠ 3

5 Yes

CASE STUDY BASED QUESTIONS

Let us denote the fixed rent by ₹ x and proportional expense per person by ₹ y.

1. Algebraic representation of the situation in "Rose" hall

x+50 y=10000

Answer- Option C

2. Algebraic representation of the situation in "Jasmine" hall

x+25y=7500

Answer- Option A

Subtracting the equations represented by (i) and (ii)

x+50y-x+25y=10000-7500

25y=2500

$y=100$

Substituting $y=100$ in $x+50y=10000$, we get

$x+50 \times 100=10000$

$x+5000=10000$

$x=5000$

3. Answer : Option D

4. Answer : Option D

SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1 Solving $5x + 10y – 50 = 0$

$10 (x/2 + y - 5) = 0$

$y = 5 - x/2$

Substituting $y = 5 - x/2$ in $x + 8y = 10$ we get

$x + 8 (5 - x/2) = 10$

$x = 10$

Thus $y = 0$

Substituting the values of x and y in $y = mx + 5$, we get

$0 = m10+5$

Therefore $m = −1/2$

2 The given pair of linear equation can be written as

$2ax+by−a=0$ and $4ax+2by−2a$

Here,

$a_1=2a$,

$b_1=b$,

$c_1=−a$

And $a_2=4a$,

$b_2=2b$,

$c2=-2a$

∴ $a1/a2 = 2a/4a = 1/2$ and $b1/b2 = b/2b = 1/2$ and $c1/c2 = -a/-2a = 1/2$

Since, $a1/a2 = b1/b2 = c1/c2 = 1/2$

∴ The given pair of linear equation is consistent.

3 Let no of cars = x and no of motorcycles = y

According to our condition

$x + y = 20$

$X = 20 - y$ (i)

$4x + 2y = 56$ (ii)

Replacing (i) in (ii) we get

$4(20 - y) + 2y = 56$

$80 - 4y + 2y = 56$

$-2y = -24$

Thus $y = 12$

Now replacing $y = 12$ in $x + y = 20$ we get

$x = 8$

4 Condition for any pair of systems to have a unique solution is $a_1/a_2 \neq b_1/b_2$

Let us consider the following equations

$a_1x + b_1y + c_1 = 0$ and

$a_2x + b_2y + c_2 = 0$

We have $x = 2$ and $y = - 1$ as the unique solution of these two equations.

Hence, it must satisfy the above equations

$a_1(2) + b_1(- 1) + c_1 = 0$

$2a_1 - b_1 + c_1 = 0$ ------------------------ (1)

$a_2(2) + b_2(- 1) + c_2 = 0$

$2a_2 + -b_2 + c_2 = 0$ ----------------------- (2)

the restricted values of a1,a2 and b1,b2 are only

a2a1=b2b1...(3)

So all the real values a1,a2,b1,b2 except condition (3) can from so many linear equations which will satisfy equation (1) and (2)

Therefore, infinitely many pairs of linear equations are possible.

Infinite number of solution.

5 According to the question

$x + y = 108$

So $x = 108 - y$

And $x – y = 8$

So $108 - y - y = 8$

$-2y = -100$

$y = 50$

Thus $x = 108 - 50 = 58$

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

1 Let the numbers be x and y.

$x + y = 75$

Thus $x = 75 - y$............(1)

$x – y = 15$............(2)

Substituting (1) in (2) $2y = 90$

So $y = 45$.

Putting $y = 45$ in (1) , $x= 30$.

Hence the numbers are $x = 30$ and $y= 45$

2 By the given conditions

The monthly income would be 5x:4x and monthly expenditure would be 7y:5y

Since saving = income - expenditure

$5x-7y=3000$ ....(1)

$4x-5y= 3000$ ....(2)

Solving, we get $x= 2000$/-

Monthly income of A = $5x= 5\times2000= 10000$/-

Monthly income of B = $4x = 4 \times 2000 = 8000$/-

3 Suppose A has x number of oranges and B has y oranges. Then

$x +10 = 2(y-10)$

$\Longrightarrow x - 2y + 30 = 0$

$y + 10 = x - 10$

$\Longrightarrow x - y - 20 = 0$

Equating both the equations we get $y=50$ and $x=70$

Hence A has 70 oranges and B has 50 oranges

4 Let right answer questions attempt by Yash be x and wrong answer questions be y

Then, $3x - y = 40$.............(i)

$4x - 2y = 50$ ....(ii)

Solving we get $x = 15$, $y = 5$

Total number of questions in the test = $x + y=15 + 5 = 20$.

5 Let no. of 20 paisa coins be x and that of 25 paisa coins be y, then

$x + y = 50$ ....(i)

$20 x + 25y = 1125 \Longrightarrow 4x + 5y = 225$ .... (ii)

Solving, we get $x=25$ and $y=25$

Hence there are 24 points of each kind.

LONG ANSWER TYPE QUESTIONS (4 Marks)

1 Let the two numbers be 5x and 6x

Then according to the question

$5x-8 : 6x-8 = 4:5$

Cross multiplying, we get

5(5x-8) = 4 (6x-8)

Solving this equation we get

x = 8

Replacing the value of x we get that the numbers are 40 and 48.

2 Let the present age of his two children be “x” years and “y” years.

Present age of father = 2(x+y)----(1)

Then, according to the question

2x+y+20=x+20+y+20

2x+2y+20=x+y+40

2x+2y-x-y=40-20

x+y=20 ----(2)

Substituting eqn (2) in eqn (1), we get

Present age of father = 2 x 20

= 40 years

3 Let the digit in ones place be y and the digit in tens place be y.

Then the two digit number = 10x+y

Given 10x+yx+y=7

⇒ 10x + y = 7 (x + y)

∴ 10x+y-7x-7y=0

3x-6y=0

x-2y=0---------(1)

According to the second condition.

10x + y - 27 = 10y + x

10x+y-10y-x=27

9x-9y=27

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

Equation (1)- equation (2)

$x-2y-x-y=0-3$

$x-2y-x+y=-3$

$-y=-3$

Thus $y=3$

Substituting $y=3$ in equation (2), we get

$x-3=3$

$x=6$

Since two-digit number $=10x+y$

So $10x6+3$

$=60+3=63$

Then $20y + y - 27 = 10y + 2y$

$\Rightarrow 9y = 27$

$\Rightarrow y = 3$

Substitute y value in eqn(1)

we get, $x = 2\times 3$

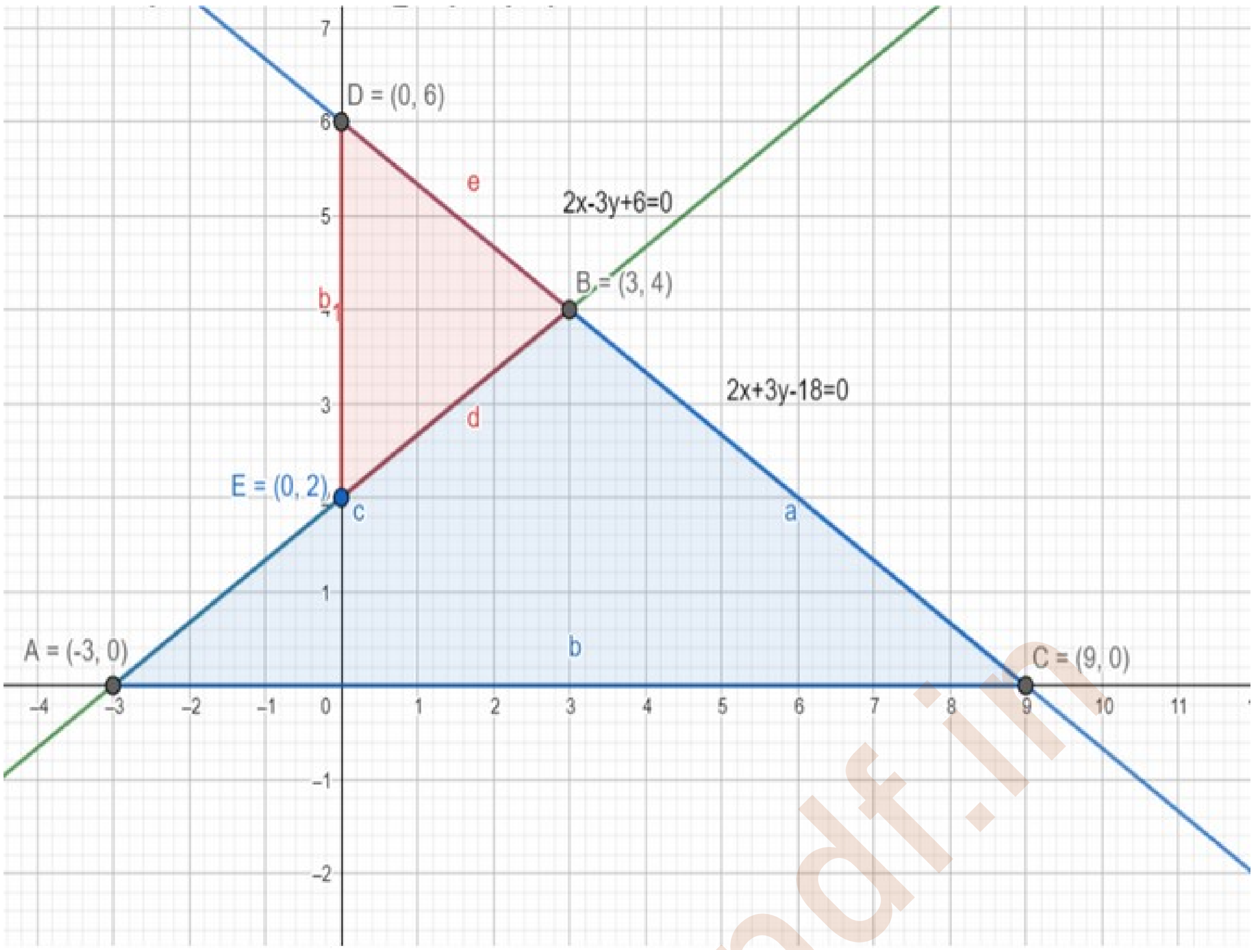
$\Rightarrow x = 6$

Hence the required number is 63.

4 Find three solutions of $2x-3y+6=0$

Find three solutions of $2x+3y-18=0$

Plot the points on the graph paper.



Area of triangle ABC formed by the lines and the X-axis

=12 x12 x4 =24 sq.units

Area of triangle DEB formed by the lines and the Y-axis

=12 x4x3 =6 sq.units

Ratio of areas of triangles formed by the given lines with X-axis and Y-axis =

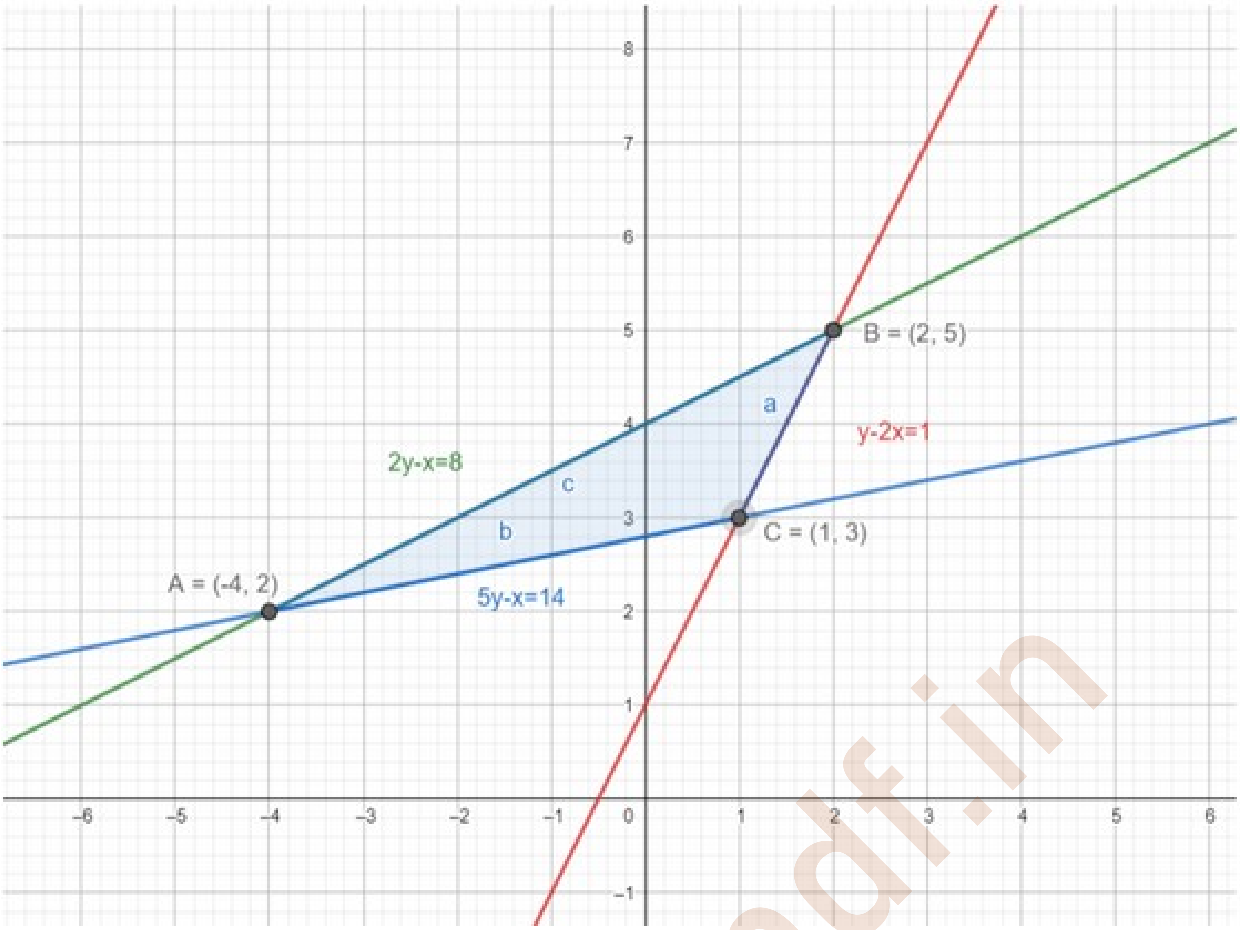
24 : 6 = 4 : 1

5 Find three solutions of 2y-x=8

Find three solutions of 5y-x=14

Find three solutions of y-2x=1

Plot the points on the graph paper.



Coordinates of triangle ABC formed between the given lines A(-4,2), B (2,5),

C(1,3)

Pair of Linear Equations in Two Variables is the second chapter of the second unit.

The other chapters in Unit two Algebra of CBSE Class 10 Maths are Polynomials,, Quadratic Equations and Arithmetic Progressions.

All the best!

Now test your preparation with these practise papaers created by subject experts to prepare you for CBSE Class 10 Math Board Examination 2023.

Important Questions for CBSE Class 10 Maths

UNIT I: NUMBER SYSTEMS

Chapter 1. REAL NUMBER

Syllabus topics: Fundamental Theorem of Arithmetic - statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of irrationality of √2 , √3 , √5

MULTIPLE CHOICE QUESTIONS AND OBJECTIVE QUESTIONS (1 MARK)

Q1. HCF of 8, 9, 25 is

a) 8

b) 9

c) 25

d) 1

Q.2. The product of a rational and irrational number is

a) Rational

b) Irrational

c) both of above

d) none of above

Q3. L.C.M. of 23 × 32 and 22 × 33 is :

a) 23

b) 33

c) 23 × 33

d) 22 × 32

Q4. State fundamental theorem of arithmetic

Q5. The product of a non-zero number and an irrational number is:

a) always irrational

b) always rational

c) rational or irrational

d) one

Q6. If p and q are two coprime numbers, then find the HCF and LCM of p and q.

Q7. Prime factorization of 120 is ...

Q8. Find the LCM of smallest prime and the smallest odd composite natural number

Q9. If HCF (26, 169) = 13, then LCM (26, 169) is ...

a) 26

b) 52

c) 338

d) 13

Q10. If the LCM of a and 18 is 36 and the HCF of a and 18 is 2, then a =?

a) 2

b) 3

c) 4

d) 1

SHORT ANSWER QUESTIONS (2 MARKS)

Q1. Find the prime factorization of 1152

Q2. Prove that √5 is irrational

Q3. The difference of the irrational numbers 5 + √2 and 5 - √2?

Q4. Explain why 3 × 5 × 7 + 7 is a composite number.

Q5. Prove that √2 is irrational

Q6. Determine the prime factorisation of 2057?

Q7. If a=23×3, b=2×3×5, c=3n×5 and LCM [a,b,c] = 23×32×5 then, n=?

Q8. If p and q are two coprime numbers, then p3 and q3 are?

Q9. The product of two numbers is 228096 and their LCM is 66. Find their HCF.

Q20. The length, breadth and height of a room are 825 cm, 675 cm and 450 cm respectively. Find the longest tape which can measure the three dimensions of the room exactly.

SHORT ANSWER QUESTIONS (3 MARKS)

Q1. Two brands of chocolates are available in packs of 24 and 15 respectively. If I buy an equal number of chocolates of both kinds, what is the least number of boxes of each kind I would need to buy?

Q2. Two bells toll at intervals of 24 minutes and 36 minutes respectively. If they toll together at 9am, after how many minutes do they toll together again, at the earliest?

Q3. There are 44 boys and 32 girls in a class. These students arranged in rows for a prayer in such a way that each row consists of only either boys or girls, and every row contains an equal number of students. Find the minimum number of rows in which all students can be arranged.

Q4.144 Cartons of coke can and 90 cartons of Pepsi can are to be stacked in a canteen. If eachstack is of the same height and is to contain cartons of the same drink. What would be the greater number of cartons each stack would have?

Q5. Find the LCM and HCF of the following pairs of positive integers by applying the prime factorization method.

1. a) 225, 240
2. b) 52 ,63 ,162

Q6.Find the largest number which divides 70 and 125 leaving reminder 5 and 8 Respectively.

Q7. Find HCF and LCM of 867 and 255 and verify the that HCF x LCM = Product of the two given numbers

Q8. Explain why 17 x 5 x 11 x 3 x 2 + 2 x11 is a composite number.

Q9.If the sum of LCM and HCF of two numbers is 1260 and their LCM is 900 more than their HCF then, find the product of two numbers.

Q10. Can two numbers have 15 as their HCF and 175 as their LCM? Give reasons.

Long Answer Type Questions (4 marks)

Q1. A hall has a certain number of chairs. Guests want to sit in different groups like in pairs, triplets, quadruplets, fives and sixes etc. When organiser arranges chairs in such pattern like 2's, 3's ,4's.5's and 6's then 1,2,3,4 and 5 chairs are left respectively. But when he arranges in 11's no chair will be left

1. In the hall how many chairs are available?

a) 407

b) 143

c) 539

d) 209

2. If one chair is added to the total number of chairs, how many chairs will be left when arranged in 11's

Q2. Kerosene, paraffin, or lamp oil is a combustible hydrocarbon liquid which is derivative from petroleum. Kerosen's uses vary from fuel for oil lamps to cleaning agents , jet fuel , heating oil or fuel for cooking Two oil tankers contain 825 litres and 675 litres of kerosene oil respectively.

1. Find the maximum capacity of a container which can measure the Kerosene oil of both the tankers when used an exact number of times.
2. How many times we have to use container for both the tanker to fill?

Q3. The sum of LCM and HCF of two numbers is 7380.If the LCM of these numbers is 7340 more than their HCF. Find the product of the two numbers.

Q4. A woman wants to organise her birthday party. She was happy on her birthday but there was a problem that she does not want to serve fast food to her guests because she is very health conscious. She as 15 apples and 40 bananas at home and decided to serve them. She want to distribute fruits among guests. She does not want to discriminate among guests so she decided to distribute equally among all. So

1. How many guests she can invite?
2. How many apples and banana will each guest get?

Q5. A charitable trust donates 28 different books of Maths,16 different books of science and 12 different books of Social Science to the poor students. Each student is given maximum number of books of only one subject of his interest and each student got equal number of books

1. Find the number of books each student got.
2. Find the total number of students who got books.

The sample papers published by CBSE for each subject. every year, is the best material to refer to for understanding the various kinds of questions that can be asked from different topics.Therefore, students must practise the sample papers as well.

ANSWERS

Que	Answer to Multiple Choice Questions
1	d) 1
2	b) irrational

3 ***c) 2^3 X 3^3***

4 **Fundamental Theorem of Arithmetic states that every integer greater than 1 is either a prime number or can be expressed in the form of primes. In other words, all the natural numbers can be expressed in the form of the product of its prime factors.**

5 **(a) Always irrational**

6 **HCF = 1 and LCM = pq**

7 ***2^3X3X5***

8 **LCM of 2 and 4 is 4**

9 **c) 338**

10 **c) 4**

Que SHORT ANSWER QUESTIONS (2 MARKS)

1 1152= 2^7 X 3^2

2 Using technique proof by contradiction

Let us assume, to the contrary, that 5 is rational.

That is, we can find integers a and b (≠ 0) such that 5 = a/b ·

Suppose a and b have a common factor other than 1, then we can divide by the

common factor, and assume that a and b are coprime.

So, b√5= ·a

Squaring on both sides, and rearranging, we get $5b^2 = a^2$.

Therefore, a@ is divisible by 5, and by theorem of proof by contradiction, let p be a prime number. If p divides a^2, then p divides a, where a is a positive integer, it follows that a is also divisible by 5.

So, we can write a = 5c for some integer c.

Substituting for a, we get $5b^2 = 25c^2$, that is, $b^2 = 5c^2$.

This means that b^2 is divisible by 5, and so b is also divisible by 5 (using theorem of proof by contradiction p = 5).

Therefore, a and b have at least 5 as a common factor.

But this contradicts the fact that a and b are coprime.

This contradiction has arisen because of our incorrect assumption that 5 is rational.

So, we conclude that √5 is irrational.

3 *2√2*

4 112 is an even number and is therefore a composite number

5 **U**sing technique proof by contradiction

Let us assume, to the contrary, that 2 is rational.

That is, we can find integers a and b (≠ 0) such that 2 = a/b ·

Suppose a and b have a common factor other than 1, then we can divide by the

common factor, and assume that a and b are coprime.

So, b√2= a

Squaring on both sides, and rearranging, we get $2b^2 = a^2$.

Therefore, a^2 is divisible by 2, and by the theorem of proof by contradiction, let p be a prime number. If p divides a^2, then p divides a, where a is a positive integer, it follows that a is also divisible by 2.

So, we can write a = 2c for some integer c.

Substituting for a, we get $2b^2 = 4c^2$, that is, $b^2 = 2c^2$.

This means that b^2 is divisible by 2, and so b is also divisible by 2 (using theorem of proof by contradiction p = 2).

Therefore, a and b have at least 2 as a common factor.

But this contradicts the fact that a and b are coprime.

This contradiction has arisen because of our incorrect assumption that 2 is rational.

So, we conclude that √2 is irrational.

6 $2 \times 5 \times 11^2 \times 17$

7 *2*

8 Coprime

9 36

10 75 cm

Que LONG ANSWER QUESTIONS (3 MARKS)

1 5 of 1st kind, 8 of 2nd kind

2

$24 = 2^3 \times 3$

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

LCM = $2^3 \times 3^2 = 8 \times 9 = 72$

After 72 minutes = 1 hr 12 minutes they toll together.

3

$44 = 2^2 \times 11$

$32 = 2^5$

HCF = $2^2 = 4$

Therefore, minimum number of rows in which all srudents can be

arranged = 44/4 + 32/4 = 11 + 8 = 19 rows

4 $144 = 2^4 \times 3^2$

$90 = 2 \times 3^2 \times 5$

HCF = 2 x 3^2 = 18 cartons

a. HCF (225, 240) = 15

LCM (225, 240) = 600

5

1. HCF (52, 6, 162) = 1

LCM (52, 63, 162) = 29484

70 – 5 = 65

125 – 8 = 117

6 65 = 5 x 13

117 = 3^2x 13

HCF = 13 i.e., 13 is the largest number that will divide 65 and 117.

LCM (867, 255) = 4335,

HCF (867, 255) = 51.

7 *Verification by showing*

*Product of 867*255 = Product of 4335*51*

Therefore, LHS = RHS i.e., 867 x 255 = 4335 x 51

17 x 5 x 11 x 3 x 2 + 2 x 11

= 2 x 11 (17 x 5 x 3 + 1)

= 2 x 11 (255 + 1)

8 = 2 x 11 x 256

= 2 x 11 x 2^8

This number has more than 2 prime factors.

Therefore, 17 x 5 x 11 x 3 x 2 + 2 x 11 is a composite number.

9 194400

No, two numbers cannot have 15 as their HCF and 175 as LCM because,

HCF of the numbers must be a factor of the LCM.

10 **OR**

Since We know that LCM divides by HCF but LCM 175 does not divide by HCF 15.

Hence, HCF and LCM of two numbers cannot be 15 and 175, respectively.

Que LONG ANSWER QUESTIONS (4 MARKS)

1 (i) 539 chairs

(ii) if 1 chair is added as 539 is already divisible by 11 ,1 chair will be left

(i) HCF of 825 and 625

825 = 3 x 5 x 5 x 11

675 = 3 x 3 x 3 x5 x 5

2 HCF = 3 x 5 x 5 = 75

Maximum capacity reqired is 75 litres

(ii) The first tanker will require 875/75 = 11 times to fill

The second tanker will require 675/75 = 9 times to fill

3 *LCM + HCF = 7380*

LCM – HCF = 7340

2LCM = 14720

LCM = 14720/2

LCM = 7360

LCM + HCF = 7380

7360+ HCF = 7380

HCF = 7380 – 7360

HCF = 20 (1)

HCF x LCM = product of numbers

20 x 7360= product of numbers

147200 = product of numbers

(i)HCF of(15,40) =5

Fruits will be distributed equally among 5 guests

4

(ii)Out of 15 apples each guest will get 15 /5 = 3 apples

Out of 40 banana each guest will get 40/5 =8 bananas

(i) HCF of 28,16 and 12 is 4

Therefore maximum number of books each student get is 4

(ii) Number of maths books 28/4 = 7

5

Number of science books 16/4 = 4

Number of social science = 12/4 = 3

Total books = 7 + 4 + 3 =14