# Previous Year Questions 2024

**Q1: The pair of linear equations x + 2y + 5 = 0 and – 3x = 6y – 1 has. (CBSE 2024)**

**(a) unique solution**

**(b) exactly two solutions**

**(c) infinitely many solutions**

**(d) no solution**

**Ans:** (d)

$x + 2y + 5 = 0$

On comparing with

$a_1x + b_1y + c_1 = 0$, we get $a_1 = 1, b_1 = 2, c_1 = 5$ – $3x = 6y - 1$

$3x + 6y - 1 = 0$

On comparing with $a_2x + b_2y + c_2 = 0$, we get $a_2 = 3, b_2 = 6, c_2 = -1$

$\frac{a_1}{a_2} = \frac{1}{3}, \frac{b_1}{b_2} = \frac{2}{6} = \frac{1}{3},$

$\frac{c_1}{c_2} = \frac{5}{-1} = -5$

**Q2: If 2x + y = 13 and 4x – y = 17, find the value of (x – y). (2024)**

**Ans:**

$2x + y = 13$ ...(i)

$4x - y = 17$ ...(ii)

On adding eqn.(i) and eqn.(ii)

$6x = 30$

$x = 5$

Put the value of x in eqn.(i)

$2 \times 5 + y = 13$

$\Rightarrow 10 + y = 13$

$\therefore y = 3$

So, $x - y = 5 - 3$

$= 2$

# Previous Year Questions 2023

**Q3: The pair of linear equations 2x = 5y + 6 and 15y = 6x - 18 represents two lines which are (2023)**

**(a) intersecting**

**(b) parallel**

**(c) coincident**

**(d) either intersecting or parallel**

**Ans:** (c)

**Sol:** The given pair of linear equations is 2x = 5y+ 6 and 15y = 6x - 18

i.e ., 2x - 5y - 6 = 0 and 6x- 15y- 18 = 0

As, 2/6 = -5/-15 = -6/-18

i.e.. 1 /3 = 1 / 3 = 1/3

Therefore, the lines are coincident.

**Q4: If the pair of linear equations x - y = 1, x + ky = 5 has a unique solution x = 2, y = 1. then the value of k (2023)**

**(a) -2**

**(b) -3**

**(c) 3**

**(d) 4**

**Ans:** (c)

**Sol:** x + ky = 5

At x = 2, y = 1

2 + k.1 = 5

∴ k = 3

**Q5: The pair of linear equations x + 2y + 5 = 0 and -3x - 6y + 1 = 0 has (2023)**

**(a) A unique solution**

**(b) Exactly two solutions**

**(c) Infinitely many solutions**

**(d) No solution**

**Ans:** (d)

x + 2y + 5 = 0

On comparing with

$a_1x + b_1y + c_1 = 0$, we get $a_1 = 1, b_1 = 2, c_1 = 5 - 3x = 6y - 1$

3x + 6y – 1 = 0

On comparing with $a_2x + b_2y + c_2 = 0$, we get $a_2 = 3, b_2 = 6, c_2 = -1$

$\frac{a_1}{a_2} = \frac{1}{3}, \frac{b_1}{b_2} = \frac{2}{6} = \frac{1}{3},$

$\frac{c_1}{c_2} = \frac{5}{-1} = -5$

**Q6: Solve the pair of equations x = 5 and y = 7 graphically. (2023)**

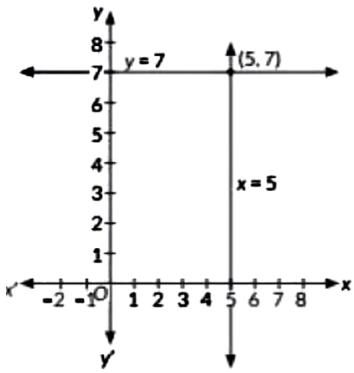
**Ans:** Given equations are

x = 5 ----------(i)

y = 7 ----------(ii)

Draw the line x = 5 parallel to the y-axis and y= 7 parallel to the x-axis.

∴ The graph of equation (i) and (ii) is as follows




The lines x = 5 and y = 7 intersect each other at (5, 7).

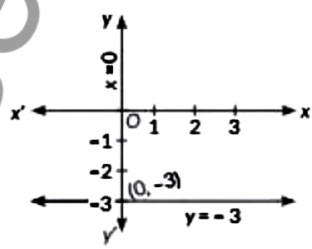
**Q7: Using the graphical method, find whether pair of equations x = 0 and y = -3 is consistent or not. (2023)**

**Ans:** Given pair of equations are

x = 0 ------(i)

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

x = 0 means y-axis and draw a line y = -3 parallel to x-axis. The graph of given equations (i) and (ii) is




The lines intersect each other at (0, -3). Therefore, the given pair of equations Is consistent.

**Q8: Half of the difference between two numbers is 2. The sum of the greater number and twice the smaller number is 13. Find the numbers. (2023)**

**Ans:** Let x and y be two numbers such that x> y

According to the question,

$\frac{x-y}{2}=2 \Rightarrow x-y=4$ ...(i)

and x + 2y = 13 ---- (ii)

Subtracting (i) from (ii), we get

3y = 9

$\Rightarrow$ y = 3

Substitute y = 3 in (i) we get

x - 3 = 4

$\Rightarrow$ x = 7

**Q9: (A) If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1 It becomes 1/2 if we only add 1 to the denominator. What is the fraction?**

**OR**

**(B) For which value of 'k' will the following pair of linear equations have no solution? (2023)**

**3x + y = 1**

**(2k - 1)x + (k - 1)y = 2k + 1**

**Ans: (A)** Let required fraction be x/y

According to question,

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

$\Rightarrow$ x + 1 = y - 1

$\Rightarrow$ x = y-2 ...(i)

Also, $\frac{x}{y+1}=\frac{1}{2}$

$\Rightarrow$ 2x = y + 1 ...(ii)

From equations (i) and (ii), we get

2y — 4 = y + 1

y = 5

$\therefore$ x = 3

Required fraction x/y is 3/5

**OR**

**(B)** 3x + y = 1

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

For no solution; $\frac{3}{2k-1}=\frac{1}{k-1}\neq\frac{1}{2k+1}$

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

2k - 1 = 3k - 3

$\Rightarrow$ k = 2

Also, $\frac{1}{k-1}\neq\frac{1}{2k+1}$

2k + 1 $\neq$ k - 1

$\Rightarrow$ k $\neq$ -2

**Q10: Two schools 'P' and 'Q' decided to award prizes to their students for two games of Hockey Rs. x per student and Cricket Rs. y per student. School 'P' decided to award a total of Rs. 9,500 for the two games to 5 and 4 students respectively, while school 'Q' decided to award Rs. 7,370 for the two games to 4 and 3 students respectively.**

**Based on the given information, answer the following questions.**

**(i) Represent the following information algebraically (in terms of x and y).**

**(ii) (a) What is the prize amount for hockey?**

**OR**

**(b) Prize amount on which game is more and by how much?**

**(iii) What will be the total prize amount if there are 2 students each from two games? (CBSE 2023)**

**Ans: (i)** For Hockey, the amount given to per student = x

For cricket, the amount given to per student = y

From the question,

$5x + 4y = 9500$ (i)

$4x + 3y = 7370$ (ii)

**(ii)** (a) Multiply (1) by 3 and (2) by 4 and then subtracting, we get

$15x + 12y - (16x + 12y) = 28500 - 29480$

$\Rightarrow -x = -980$

$\Rightarrow x = 980$

The prize amount given for hockey is Rs. 980 per student

(b) Multiply (1) by 4 and (2) by 5 and then subtracting, we get

$20x + 16y - 20x - 15y = 38000 - 36850$

$\Rightarrow y = 1150$

The prize amount given for cricket is more than hockey by (1150 - 980) = 170.

**(iii)** Total prize amount = 2 x 980 + 2 x 1150

= Rs. (1960 + 2300) = Rs. 4260

# Previous Year Questions 2022

**Q11: The pair of lines represented by the linear equations 3x + 2y = 7 and 4x + 8y -11 = 0 are (2022)**

**(a) perpendicular**

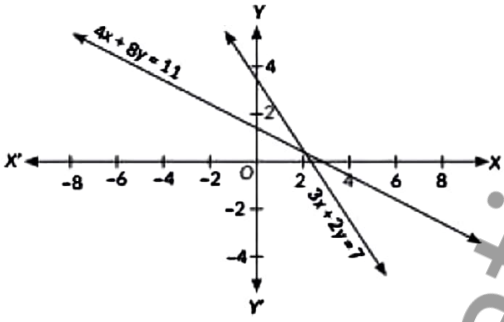
**(b) parallel**

**(c) intersecting**

**(d) coincident**

**Ans:** (c)

**Sol:** Clearly, from the graph, we can see that both lines intersect each other.




**Q12: The pair of equations y = 2 and y = - 3 has (2022)**

**(a) one solution**

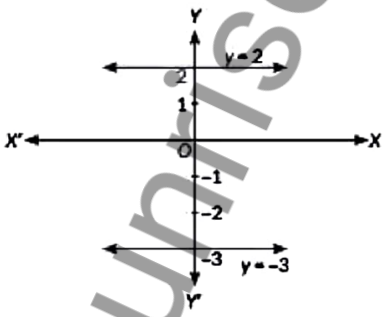
**(b) two solutions**

**(c) infinitely many solutions**

**(d) no solution**

**Ans:** (d)

**Sol:** Given equations are, y = 2 and y = - 3.




Clearly, from the graph, we can see that both equations are parallel to each other.

So, there will be no solution.

**Q13: A father is three times as old as his son. In 12 years time, he will be twice as old as his son. The sum of the present ages of the father and the son is (2022)**

**(a) 36 years**

**(b) 48 years**

**(c) 60 years**

**(d) 42 years**

**Ans:** (b)

**Sol:** Let age of father be 'x' years and age of son be 'y' years.

According to the question, $x = 3y$ ..(i)

and $x + 12 = 2(y + 12)$

$\Rightarrow x - 2y = 12$ ..(ii)

From (i) and (ii), we get $x = 36, y = 12$

$\therefore x + y = 48$ years

**Q14: If $17x - 19y = 53$ and $19x - 17y = 55$, then the value of $(x + y)$ is (2022)**

**(a) 1**

**(b) -1**

**(c) 3**

**(d) -3**

**Ans:** (a)

**Sol:** Given, $17x - 19y = 53$ ...(i)

and $19x - 17y = 55$ _(ii)

Multiplying (i) by 19 and (ii) by 17, and by subtracting we get,

$323x - 361y - (323x - 289y) = 1007 - 935$

$\Rightarrow -72y = 72$

$\Rightarrow y = -1$

Putting $y = -1$ in (i), we get,

$17x - 19(-1) = 53$

$\Rightarrow 17x = 53 - 19$

$\Rightarrow 17x = 34$

$x = 2$

$\therefore x + y = 2 - 1$

$= 1$

# Previous Year Questions 2021

**Q15: The value of k. for which the pair of linear equations x + y - 4 = 0, 2x + ky - 3 = 0 have no solution, is (2021)**

**(a) 0**

**(b) 2**

**(c) 6**

**(d) 8**

**Ans:** (b)

Given equations:

$x + y - 4 = 0$

$x + ky - 3 = 0$

The general form of a linear equation is $ax + by + c = 0$. So, comparing terms:

For the first equation, $a_1 = 1, b_1 = 1, c_1 = -4$.

For the second equation, $a_2 = 2, b_2 = k, c_2 = -3$.

For the lines to be parallel (and hence have no solution), we need:

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

So, 1/2 = 1/k

Cross-multiplying gives:

k = 2

Now, let's check the condition for the constants:

$$\frac{c_1}{c_2} = \frac{-4}{-3} = \frac{4}{3}$$

Since 1/2 = 1/k when k = 2 but 1/2 ≠ 4/3, the condition for no solution is satisfied.

Thus, the value of $k$k for which the equations have no solution is: 2

So, the correct answer is (b) 2.

**Q16: The solution of the pair of linear equations x = -5 and y = 6 is (2021)**

**(a) (-5, 6)**

**(b) (-5, 0)**

**(c) (0, 6)**

**(d) (0, 0)**

**Ans:** (a)

**Sol:** (-5, 6) is the solution of x = -5 and y = 6.

**Q17: The value of k for which the pair of linear equations 3x + 5y = 8 and kx + 15y = 24 has infinitely many solutions, is (2021)**

**(a) 3**

**(b) 9**

**(c) 5**

**(d) 15**

**Ans:** (b)

**Sol:** For. infinitely many solutions

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

$$\Rightarrow \frac{3}{k} = \frac{5}{15} = \frac{8}{24}$$

$k = 9$

**Q18: The values of x and y satisfying the two equations 32x + 33y = 34, 33x + 32y = 31 respectively are: (2021)**

**(a) -1, 2**

**(b) -1, 4**

**(c) 1, -2**

**(d) -1, -4**

**Ans:** (a)

**Sol:** 32x + 33y = 34 ...(i)

33x + 32y = 31 ...(ii)

Adding equation (i) and (ii) and subtracting equation (ii) from (i),

we get 65x + 65y = 65 or x + y = 1 ...(iii)

and - x + y = 3 ...(iv)

Adding equation (iii) and (iv),

we get y = 2

Substituting the value of y in equation (iii),

x = -1

**Q19: Two lines are given to be parallel. The equation of one of the lines is 3x - 2y = 5. The equation of the second line can be (2021)**

**(a) 9x + 8 y = 7**

**(b) - 12 x - 8 y = 7**

**(c) - 12 x + 8y = 7**

**(d) 12x + 8y = 7**

**Ans:** (c)

**Sol:** If two lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are parallel, then

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

It can only possible between 3x - 2y = 5 and -12x + 8y = 7.

**Q20: The sum of the numerator and the denominator of a fraction is 18. If the denominator is increased by 2, the fraction reduces to 1/3. Find the fraction. (2021)**

**Ans:** 5/13

Let the numerator be x and the denominator be y of the fractions. Then, the fraction = x /y.

Given , x + y = 13 - (i)

and $\frac{x}{y+2} = \frac{1}{3}$

$\Rightarrow$ 3x - y = 2 . . (ii)

Adding (i) and (ii), we get

4x = 20 $\Rightarrow$ x = 5

Put the value of x in (i), we get

5+ y= 18

$\Rightarrow$ y = 13

$\therefore$ The required fraction is 5/13

**Q21: Find the value of K for which the system of equations x + 2y = 5 and 3x + ky + 15 = 0 has no solution. (2021)**

**Ans:** Given, the system of equations

x + 2y = 5

3k + ky = - 15 has no solution.

$\therefore \quad \frac{1}{3} = \frac{2}{k} \neq \frac{5}{-15} \Rightarrow k = 6$

For K = 6 the given system of equations has no solution.

**Q22: Case study-based question is compulsory.**

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 ₹22 for a book and kept for 6 days: while Radhika paid ₹16 for keeping the book for 4 days.

**Assume that the fixed charge be ₹x and additional charge (per day) be ₹y.**

**Based on the above information, answer any four of the following questions.**

**(i) The situation of amount paid by Radhika. is algebraically represented by (2021)**

**(a) x - 4 y = 16**

**(b) x + 4 y = 16**

**(c) x - 2 y = 16**

**(d) x + 2 y = 16**

**Ans:** (d)

**Sol:** For Amruta, x + (6 - 2)y = 22

i. e., x + 4y = 22 ...(i)

For Radhika, x + (4 - 2)y = 16 i.e.,x + 2y = 16 ...(ii)

Solving equation (i) and (ii). we get

x = 10 and y = 3

i.e., Fixed charges (x) = 710 ...(iii)

and additional charges per subsequent day

(y) = ₹ 3 ...(iv)

x + 2 y = 16 [From equation (ii)]

**(ii) The situation of amount paid by Amruta. is algebraically represented by (2021)**

**(a) x - 2y = 11**

**(b) x - 2y = 22**

**(c) x + 4 y = 22**

**(d) x - 4 y = 11**

**Ans:** (c)

**Sol:** For Amruta, x + (6 - 2)y = 22

i. e., x + 4y = 22 ...(i)

For Radhika, x + (4 - 2)y = 16 i.e.,x + 2y = 16 ...(ii)

Solving equation (i) and (ii). we get

x = 10 and y = 3

i.e., Fixed charges (x) = 710 ...(iii)

and additional charges per subsequent day

(y) = ₹ 3 ...(iv)

x + 4 y = 22 [From equation (i)]

**(iii) What are the fixed charges for a book? (2021)**

**(a) ₹ 9**

**(b) ₹ 10**

**(c) ₹ 13**

**(d) ₹ 15**

**Ans:** (b)

**Sol:** For Amruta, x + (6 - 2)y = 22

i. e., x + 4y = 22 ...(i)

For Radhika, x + (4 - 2)y = 16 i.e.,x + 2y = 16 ...(ii)

Solving equation (i) and (ii). we get

x = 10 and y = 3

i.e., Fixed charges (x) = 710 ...(iii)

and additional charges per subsequent day

y = ₹ 3 ...(iv)

x = ₹ 10 [From equation (iii)]

**(iv) What are the additional charges for each subsequent day for a book? (2021)**

**(a) ₹ 6**

**(b) ₹ 5**

**(c) ₹ 4**

**(d) ₹ 3**

**Ans:** (d)

**Sol:** For Amruta, x + (6 - 2)y = 22

i. e., x + 4y = 22 ...(i)

For Radhika, x + (4 - 2)y = 16 i.e.,x + 2y = 16 ...(ii)

Solving equation (i) and (ii). we get

x = 10 and y = 3

i.e., Fixed charges (x) = 710 ...(iii)

and additional charges per subsequent day

y = ₹ 3 ...(iv)

y = ₹ 3 [From equation (iv)]

**(v) What is the total amount paid by both, if both of them have kept the book for 2 more days? (2021)**

**(a) ₹ 35**

**(b) ₹ 52**

**(c) ₹ 50**

**(d) ₹ 58**

**Ans:** (c)

For Amruta, x + (6 - 2)y = 22

i. e., x + 4y = 22 ...(i)

For Radhika, x + (4 - 2)y = 16 i.e.,x + 2y = 16 ...(ii)

Solving equation (i) and (ii). we get

x = 10 and y = 3

i.e., Fixed charges (x) = 710 ...(iii)

and additional charges per subsequent day

y = ₹ 3 ...(iv)

Total amount paid for 2 more days by both

= (x + 4 y) + 2 y + (x + 2y ) + 2 y

= 2 x + 10y

= 2 x 10 + 10 x 3

= ₹ 50

# Previous Year Questions 2020

**Q23: The pair of equations x = a and y = b graphically represent lines which are (2020)**

**(a) Intersecting at (a, b)**

**(b) Intersecting at (b, a)**

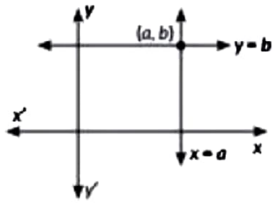
**(c) Coincident**

**(d) Parallel**

**Ans:** (a)

**Sol:** The pair of equations x = a and y = b graphically represent lines which are parallel to the y-axis and x-axis respectively.

The lines will intersect each other at (a, b).




**Q24: If the equations kx - 2y = 3 and 3x + y = 5 represent two intersecting lines at unique point then the value of k is _____. (2020)**

**Ans:** For any real number except k = -6

kx - 2y = 3 and 3x + y = 5 represent lines intersecting at a unique point.

$\Rightarrow \frac{k}{3} \neq \frac{-2}{1}$

$\Rightarrow k \neq -6$

For any real number except fc = -6

The given equation represent two intersecting lines at unique point.

**Q25: The value of k for which the system of equations x + y - 4 = 0 and 2x + ky = 3, has no solution. is (2020)**

**(a) -2**

**(b) ≠2**

**(c) 3**

**(d) 2**

**Ans:** (d)

**Sol:** For no solution; $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

$\therefore \quad \frac{1}{2} = \frac{1}{k} \neq \frac{-4}{-3}$

$\Rightarrow \quad \boxed{k = 2}$

Hence, option (d) is correct

**Q26: 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. (2020)**

**Ans:** Solutions of linear equations

2y - x = 8 ..(i)

5y - x = 14 ...(ii)

and y - 2x = 1 ...(iii)

are given below:

| x | -4 | 0 | 2 |
|---|---|---|---|
| y | 2 | 4 | 5 |

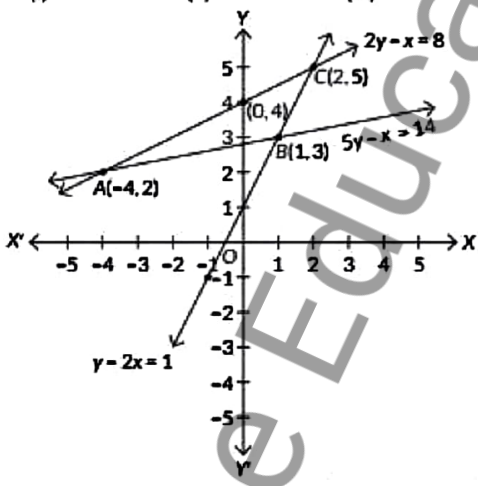
(i)

| x | -4 | 1 |
|---|---|---|
| y | 2 | 3 |

(ii)

| x | -1 | 1 | 2 |
|---|---|---|---|
| y | -1 | 3 | 5 |

(iii)




From the graph of lines represented by given equations, we observe that

Lines (i) and (iii) intersect each other at C(2, 5),

Lines (ii) and {iii) intersect each other at B(1, 3) and Lines (i) and (ii) intersect each other at 4(-4, 2).

Coordinates of the vertices of the triangle are A(-4, 2), B(1, 3) and C(2, 5).

**Q27: Solve the equations x + 2y = 6 and 2x - 5y = 12 graphically. (2020)**

**Ans:** Solution of linear equations

$x + 2y = 6$ and $2x - 5y = 12$

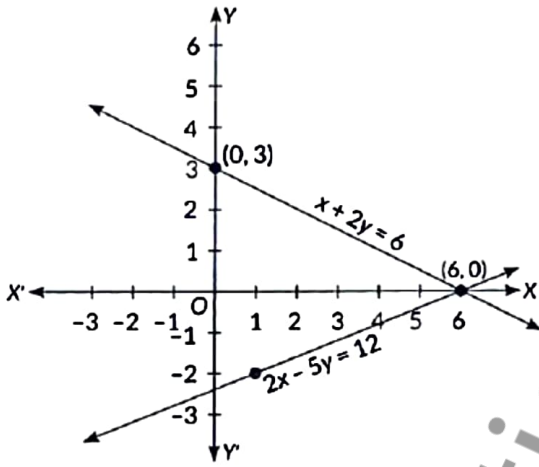
are given below

| x | 0 | 6 |
|---|---|---|
| y | 3 | 0 |

(i)

| x | 6 | 1 |
|---|---|---|
| y | 0 | -2 |

(ii)




From the graph, the two lines intersect each other at point (6, 0)

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

**Q28: A fraction becomes 1/3 when 1 is subtracted from the numerator and it becomes 1/4 when 8 is added to its denominator. Find the fraction. (CBSE 2020)**

**Ans:** Let the required fraction be x/y.

According to question, we have

$$\frac{x-1}{y}=\frac{1}{3} \quad \text{...(i)}$$

$$\text{and } \frac{x}{y+8}=\frac{1}{4} \quad \text{...(ii)}$$

From (i), $3x - 3 = y$

$\Rightarrow 3x - y - 3 = 0$ ...(iii)

From (ii), $4x = y + 8$

so, $4x - y - 8 = 0$ ... (iv)

Subtracting (iii) from (iv),

we get $x = 5$

Substituting the value of x in (iii),

we get $y = 12$

Thus, the required fraction is 5/12

**Q29: 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. (2020)**

**Ans:** Let the present age of son be x years and that of father be y years.

According to question, we have

$y = 3x + 3 \Rightarrow 3x - y + 3 = 0$ (i)

And $y + 3 = 2(x + 3) + 10$

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

$\Rightarrow 2x - y + 13 = 0$ (ii)

Subtracting (ii) from (i), we get x = 10

Substituting the value of x in (ii). we get y = 33

So. the present age of the son is 10 years and that of the father is 33 years.

**Q30: Solve graphically : 2x + 3y = 2, x - 2y = 8 (2020)**

**Ans:** Given lines are 2x + 3y = 2 and x - 2y = 8 2x + 3y = 2

$\Rightarrow y = \frac{2-2x}{3}$

| x | 1 | -2 | 4 |
|---|---|---|---|
| y | 0 | 2 | -2 |

and x - 2y = 8

$\Rightarrow y = \frac{x-8}{2}$

| x | 0 | 8 | 2 |
|---|---|---|---|
| y | -4 | 0 | -3 |

∴ We will plot the points (1, 0), (-2, 2) and (4, - 2 ) and join them to get the graph o f 2x + 3y = 2 and we will plot the points (0, -4), (8, 0) and (2, -3) and join them to get the graph of x - 2y = 8

**Q31: A train covered a certain distance at a uniform speed. If the train would have been 6 km/hr faster, it would have taken 4 hour less than the scheduled time and if the train were slower by 6 km/hr, it would have taken 6 hours more than the scheduled time. Find the length of the journey. (CBSE 2020)**

**Ans:** Let the original uniform speed of the train be x km/hr and the total length of journey be l km. Then, scheduled time taken by the train to cover a distance of l km = l/x hours

Now,

$$\frac{l}{x+6} = \frac{l}{x} - 4$$

$$\Rightarrow \frac{l}{x} - \frac{l}{x+6} = 4$$

$$\Rightarrow \left(\frac{x + 6 - x}{x(x + 6)}\right) l = 4$$

$$\Rightarrow \frac{6l}{x(x + 6)} = 4$$

$$\Rightarrow l = \frac{2x(x+6)}{3} \quad \text{...(i)}$$

Also, $\frac{l}{x-6} = \frac{l}{x} + 6$

$\Rightarrow \frac{l}{x-6} - \frac{l}{x} = 6$

$\Rightarrow \left(\frac{x-x+6}{(x-6)x}\right) l = 6$

$\Rightarrow \frac{6l}{(x-6)x} = 6$

$\Rightarrow l = x(x-6)$ ....(ii)

From equations (i) and (ii), we have

$\frac{2x(x+6)}{3} = x(x-6)$

$\Rightarrow 2x + 12 = 3x - 18$

$\Rightarrow x = 30$

Putting the value of x in eq. (ii), we get

l = 30(30 – 6)

= 30 × 24

= 720

Hence, the length of the journey is 720 km.

# Previous Year Questions 2019

**Q32: Draw the graph of the equations x - y + 1 = 0 and 3x + 2y - 12 = 0. Using this graph, find the values of x and y which satisfy both the equations. (2019)**

**Ans:** Solutions of linear equation

x - y + 1 = 0 ...(i)

and 3x + 2y - 12 = 0 ...(ii)

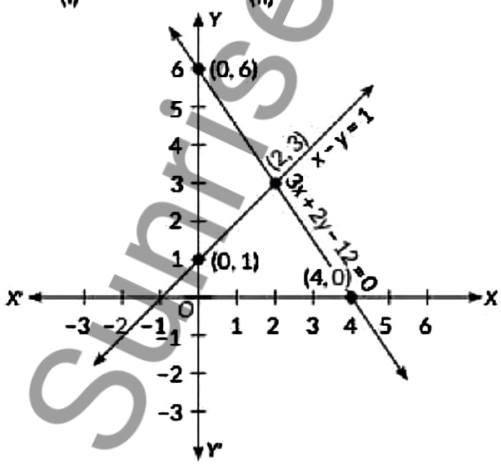
are given below:

| x | 0 | -1 |
|---|---|---|
| y | 1 | 0 |

(i)

| x | 4 | 0 |
|---|---|---|
| y | 0 | 6 |

(ii)




From the graph, the two lines intersect each other at the point (2, 3)

∴ x = 2, y = 3.

**Q33: The larger of two supplementary angles exceeds the smaller by 18°. Find the angles. (2019)**

Ans: Let the larger angle be x° and the smaller angle be y°. We know that the sum of two supplementary pairs of angles is always 180°.

We have x° + y° = 180° (i)

and x° - y° = 18° (ii) [Given]

By (1), we have x° = 180° - y° _(iii)

Put the value of x° in (ii), we get

180° - y° - y° = 18°

⇒ 162° = 2y°

⇒ y = 81

From (3), we have x° = 180° - 81° = 99°

The angles are 99° and 81°

**Q34: Solve the following pair of linear equations: 3x - 5y =4, 2y+ 7 = 9x. (2019)**

**Ans:** Given, pair of linear equations:

3x - 5y =4, (i)

2y+ 7 = 9x

9x - 2y = 7 (ii)

Multiply (i) by 3 and subtract from (ii), as

$\Rightarrow \quad 9x - 2y - (9x - 15y) = 7 - 12$

$\Rightarrow \quad 9x - 2y - 9x + 15y = -5 \Rightarrow 13y = -5 \Rightarrow y = \frac{-5}{13}$

Put $y = \frac{-5}{13}$ in (i), we get

$3x - 5\left(\frac{-5}{13}\right) = 4$

$\Rightarrow \quad 3x + \frac{25}{13} = 4 \quad \Rightarrow \quad 3x = 4 - \frac{25}{13} \Rightarrow \quad x = \frac{27}{13 \times 3} = \frac{9}{13}$

Hence, x = 9/13 and y = -5/13

**Q35: A father's age is three times the sum of the ages of his two children. After 5 years his age will be two times the sum of their ages. Find the present age of the father. (2019)**

**Ans:** Let the ages of two children be x and y respectively.

Father's present age = 3(x +y)

After 5 years, sum of ages of children = x + 5 + y + 5

= x + y + 10

and age of father = 3(x + y) + 5

According to the question,

$3(x + y) + 5 = 2(x + y + 10)$

$3x + 3y + 5 = 2x + 2y + 20$

$\Rightarrow x + y = 15$

Hence, present age of father = $3(x + y)$

$= 3 \times 15 = 45$ years

**Q36: A fraction becomes 1/3 when 2 is subtracted from the numerator and ii becomes 1/2 when 1 is subtracted from the denominator. Find the fraction. (2019)**

Ans: Let the fraction be x/y

Then, according to question.

$$\frac{x-2}{y}=\frac{1}{3} \text{ and } \frac{x}{y-1}=\frac{1}{2}$$

$$\Rightarrow \quad 3x - 6 = y \text{ and } 2x = y - 1$$

$$\Rightarrow \quad 3x - y - 6 = 0 \ldots \text{(i) and } 2x - y + 1 = 0 \qquad \ldots \text{(ii)}$$

Subtracting (ii) from (i), we get $x - 7 = 0$

So, $x = 7$

From (i) ,$3(7) - y - 6 = 0$

$\Rightarrow 21 - 6 = y$

$\Rightarrow y = 15$

Therefore required fraction is 7/15

**Q37: Find the value(s) of k so that the pair of equations x + 2y = 5 and 3x + ky + 15 = 0 has a unique solution. (2019)**

**Ans:** The given pair of linear equations is

$x + 2y = 5$

$3x + ky = -15$

Since the system of equations has a unique solution

$$\therefore \quad \frac{1}{3} \neq \frac{2}{k} \Rightarrow k \neq 6$$

∴ For all values of k except k = 6, the given pair of linear equations will have a unique solution.

**Q38: Find the relation between p and q if x = 3 and y = 1 is the solution of the pair of equations x - 4y + p = 0 and 2x + y - q -2 = 0. (2019)**

**Ans:** Given pair of equations are

$x - 4y + p = 0$ (i)

and $2x + y - q - 2 = 0$ (ii)

It is given that $x = 3$ and $y = 1$ is the solution of (i) and (ii)

$\therefore 3 - 4 \times 1 + p = 0$

$\Rightarrow p = 1$

and $2 \times 3 + 1 - q - 2 = 0$

$\Rightarrow q = 5$

$\therefore q = 5p$

**Q39: For what value of k, does the system of linear equations 2x + 3y=7 and (k – 1)x + (k + 2) y = 3k have an infinite number of solutions?(CBSE 2019)**

**Ans:** The given system of linear equations are:

$2x + 3y = 7$

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

For infinitely many solutions:

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

Here,

$a_1 = 2, b_1 = 3, c_1 = -7$ and

$a_2 = (k - 1), b_2 = (k + 2), c_2 = -3k$

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

$$\Rightarrow \quad 2(k + 2) = 3(k - 1); 3(3k) = 7(k + 2)$$

$\Rightarrow 2k - 3k = -3 - 4; 9k - 7k = 14$

$\Rightarrow -k = -7; 2k = 14$

$\Rightarrow k = 7; k = 7$ Hence, the value of k is 7