**1. Aftab tells his daughter, “Seven years ago, I was seven times as old as you were then. Also, three years from now, I shall be three times as old as you will be.” (Isn’t this interesting?) Represent this situation algebraically and graphically.**

**Ans.**Let the present age of Aftab and his daughter be x and y respectively.  
Seven years ago, Age of Aftab = x – 7 and Age of his daughter = y – 7  
According to the given condition,  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image001.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image002.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image003.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image002.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image004.png  
Again, Three years hence, Age of Aftab = x + 3 and Age of his daughter = y + 3  
According to the given condition,  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image005.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image002.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image006.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image002.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image007.png  
Thus, the given conditions can be algebraically represented as:  
x – 7y = –42

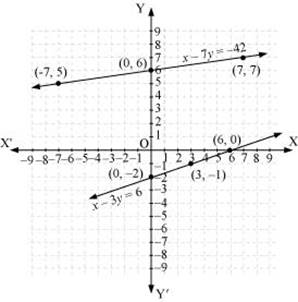
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image002.pngx = –42 + 7y  
Three solutions of this equation can be written in a table as follows:

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image008.png

And x – 3y = 6

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image002.pngx = 6 + 3y  
Three solutions of this equation can be written in a table as follows:

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image009.png



The graphical representation is as follows:

**Concept insight:** In order to represent the algebraic equations graphically the solution set of equations must be taken as whole numbers only for the accuracy. Graph of the two linear equations will be represented by a straight line.

NCERT Solutions for Class 10 Maths Exercise 3.1

**2. The coach of a cricket team buys 3 bats and 6 balls for Rs 3900. Later, she buys another bat and 3 more balls of the same kind for Rs 1300. Represent this situation algebraically and graphically.**

**Ans.**Let cost of 1 cricket bat = Rs x and let cost of 1 cricket ball= Rs y

**According to given conditions, we have**

3*x*+ 6*y*= 3900 ⇒ *x*+ 2*y*= 1300… **(1)**

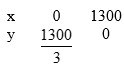
And x + 3y = 1300… **(2)**

To represent them graphically, we will find 3 sets of points which lie on the lines.

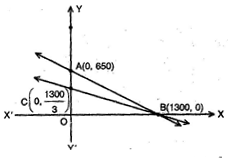
For equation x + 2y = 1300, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image011.png

For equation x + 3y = 1300, we have following points which lie on the line



We plot the points for both of the equations and it is the graphical representation of the given situation.



It is clear that these lines intersect at B (1300,0).

NCERT Solutions for Class 10 Maths Exercise 3.1

**3. The cost of 2 kg of apples and 1 kg of grapes on a day was found to be Rs 160. After a month, the cost of 4 kg of apples and 2 kg of grapes is Rs 300. Represent the situation algebraically and geometrically.**

**Ans.**Let cost of 1 kg of apples = Rs x and let cost of 1 kg of grapes= Rs y

**According to given conditions, we have**

2*x*+ *y*= 160… **(1)**

4*x*+ 2*y*= 300

⇒ 2*x*+ *y*= 150… **(2)**

So, we have equations **(1)** and **(2),**2*x*+ *y*= 160 and 2*x*+ *y*= 150 which represent given situation algebraically.

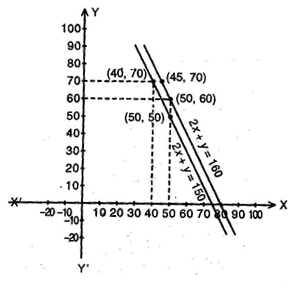
For equation 2x + y = 160, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image014.png

For equation 2x + y = 150, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.1/image015.png

We plot the points for both of the equations and it is the graphical representation of the given situation.



## NCERT Solutions for Class 10 Maths Pair of Linear Equations in Two Variables

**1. Form the pair of linear equations in the following problems, and find their solutions graphically.**

**(i) 10 students of class X took part in a mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.**

**(ii) 5 pencils and 7 pens together cost Rs 50, whereas 7 pencils and 5 pens together cost Rs. 46. Find the cost of one pencil and that of one pen.**

**Ans. (i)**Let number of boys who took part in the quiz = x

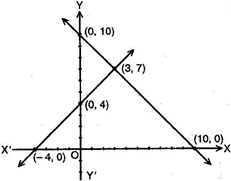
Let number of girls who took part in the quiz = y

**According to given conditions, we have**

x + y = 10… **(1)**

And, y = x + 4

⇒ x – y = −4 … **(2)**



For equation x + y = 10, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image002.png

For equation x – y = –4, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image003.png

We plot the points for both of the equations to find the solution.

We can clearly see that the intersection point of two lines is **(3, 7).**

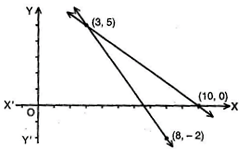
Therefore, number of boys who took park in the quiz = 3 and, number of girls who took part in the quiz = 7.

**(ii)**Let cost of one pencil = Rs x and Let cost of one pen = Rs y

NCERT Solutions for Class 10 Maths Exercise 3.2

**According to given conditions, we have**

5x + 7y = 50… **(1)**



7x + 5y = 46… **(2)**

For equation 5x + 7y = 50, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image005.png

For equation 7x + 5y = 46, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image006.png

We can clearly see that the intersection point of two lines is **(3, 5).**

Therefore, cost of pencil = Rs 3 and, cost of pen = Rs 5

NCERT Solutions for Class 10 Maths Exercise 3.2

###### ****2. On comparing the ratios****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image007.png****, find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincident:****

**(i) 5x − 4y + 8 = 0**

**(ii)9x + 3y + 12 = 0**

**7x + 6y – 9 = 018x + 6y + 24 = 0**

**(iii) 6x − 3y + 10 = 0**

**2x – y + 9 = 0**

**Ans. (i)** 5x − 4y + 8 = 0, 7x + 6y – 9 = 0

Comparing equation 5x − 4y + 8 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png and 7x + 6y – 9 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image009.png

We get, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image010.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image011.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image012.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image013.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image014.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image015.png

We have http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image016.pngbecause http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image017.png

Hence, lines have unique solution which means they intersect at one point.

**(ii)** 9x + 3y + 12 = 0, 18x + 6y + 24 = 0

Comparing equation 9x + 3y + 12 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png and 18x + 6y + 24 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image018.png,

We get, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image019.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image020.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image021.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image022.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image014.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image023.png

We have http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image024.png because http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image025.png

Hence, lines are coincident.

**(iii)** 6x − 3y + 10 = 0, 2x – y + 9 = 0

Comparing equation 6x − 3y + 10 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png and 2x – y + 9 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image018.png,

We get, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image026.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image027.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image028.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image029.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image030.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image031.png

We have http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image032.png because http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image033.png

Hence, lines are parallel to each other.

NCERT Solutions for Class 10 Maths Exercise 3.2

###### ****3. On comparing the ratios****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image007.png****, find out whether the following pair of linear equations are consistent, or inconsistent.****

**(i) 3x + 2y = 5, 2x − 3y = 8**

**(ii) 2x − 3y = 7, 4x − 6y = 9**

**(iii)**http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image042.png 9x − 10y = 14

**(iv)**5x − 3y = 11, −10x + 6y = −22

**Ans. (i)** 3x + 2y = 5, 2x − 3y = 7

Comparing equation 3x + 2y = 5 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png and 2x − 3y = 7 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image018.png,

We get, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image035.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image036.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image037.png and http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image038.png

Here http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image016.pngwhich means equations have unique solution.

Hence they are consistent.

**(ii)** 2x − 3y = 8, 4x − 6y = 9

Comparing equation 2x − 3y = 8 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png and 4x − 6y = 9 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image018.png,

We get, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image039.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image040.png

Here http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image032.pngbecause http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image041.png

Therefore, equations have no solution because they are parallel.

Hence, they are inconsistent.

**(iii)** http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image042.png 9x − 10y = 14

Comparing equation http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image034.pngwith http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png and 9x − 10y = 14 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image018.png,

We get, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image043.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image044.png, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image045.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image046.png

 and 

Here http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image016.png

Therefore, equations have unique solution.

Hence, they are consistent.

**(iv)** 5x − 3y = 11, −10x + 6y = −22

Comparing equation 5x − 3y = 11 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png and −10x + 6y = −22 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image018.png,

We get, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image049.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image050.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image051.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image052.png and http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image053.png

Here http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image054.png

Therefore, the lines have infinite many solutions.

Hence, they are consistent.

NCERT Solutions for Class 10 Maths Exercise 3.2

###### ****4. Which of the following pairs of linear equations are consistent/inconsistent? If consistent, obtain the solution graphically:****

**(i) x + y = 5, 2x + 2y = 10**

**(ii) x – y = 8, 3x − 3y = 16**

**(iii) 2x + y = 6, 4x − 2y = 4**

**(iv) 2x − 2y – 2 = 0, 4x − 4y – 5 = 0**

**Ans. (i)** x + y = 5, 2x + 2y = 10

For equation x + y – 5 = 0, we have following points which lie on the line

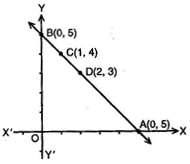
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image055.png

For equation 2x + 2y – 10 = 0, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image056.png

We can see that both of the lines coincide. Hence, there are infinite many solutions. Any point which lies on one line also lies on the other. Hence, by using equation (x + y – 5 = 0), we can say that x = 5 − y

We can assume any random values for y and can find the corresponding value of x using the above equation. All such points will lie on both lines and there will be infinite number of such points.

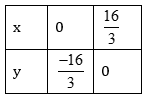


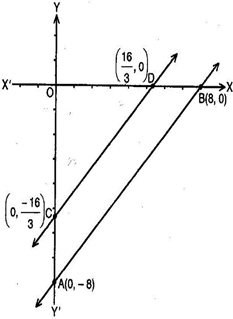
**(ii)** x – y = 8, 3x − 3y = 16

For x – y = 8, the coordinates are:

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image058.png

And for 3x – 3y = 16, the coordinates





Plotting these points on the graph, it is clear that both lines are parallel. So the two lines have no common point. Hence the given equations have no solution and lines are inconsistent.

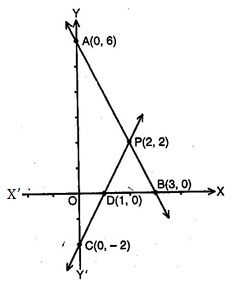
**(iii)** 2x + y = 6, 4x − 2y = 4

For equation 2x + y – 6 = 0, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image061.png

For equation 4x – 2y – 4 = 0, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image062.png



We can clearly see that lines are intersecting at (2, 2) which is the solution.

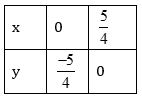
Hence x = 2 and y = 2 and lines are consistent.

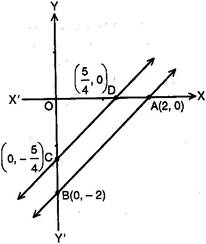
**(iv)** 2x − 2y – 2 = 0, 4x − 4y – 5 = 0

For 2x – 2y – 2 = 0, the coordinates are:

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image064.png

And for 4x – 4y – 5 = 0, the coordinates





Plotting these points on the graph, it is clear that both lines are parallel. So the two lines have no common point. Hence the given equations have no solution and lines are inconsistent.

NCERT Solutions for Class 10 Maths Exercise 3.2

###### ****5. Half the perimeter of a rectangle garden, whose length is 4 m more than its width, is 36 m. Find the dimensions of the garden.****

**Ans.**Let length of rectangular garden = x metres

Let width of rectangular garden = y metres

According to given conditions, perimeter = 36 m

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image067.pngx + y = 36 ……(i)

And x = y + 4

⇒ x – y = 4……..(ii)

Adding eq. (i) and (ii),

2x = 40

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image067.png x = 20 m

Subtracting eq. (ii) from eq. (i),

2y = 32

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image067.png y = 16 m

Hence, length = 20 m and width = 16 m

NCERT Solutions for Class 10 Maths Exercise 3.2

###### ****6. Given the linear equation (2x + 3y – 8 = 0), write another linear equation in two variables such that the geometrical representation of the pair so formed is:****

**(i) Intersecting lines**

**(ii) Parallel lines**

**(iii) Coincident lines**

**Ans. (i)** Let the second line be equal to http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image018.png

Comparing given line **2x + 3y – 8 = 0**with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png,

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image068.png

Two lines intersect with each other if http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image069.png

So, second equation can be **x + 2y = 3** because http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image069.png

**(ii)**Let the second line be equal to http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image018.png

Comparing given line **2x + 3y – 8 = 0 w**ith http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png,

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image068.png

Two lines are parallel to each other if http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image032.png

So, second equation can be **2x + 3y – 2 = 0** because http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image032.png

**(iii)**Let the second line be equal to http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image018.png

Comparing given line **2x + 3y – 8 = 0 w**ith http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image008.png,

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image068.png

Two lines are coincident if http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image054.png

So, second equation can be **4x + 6y – 16 = 0** because http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image054.png

NCERT Solutions for Class 10 Maths Exercise 3.2

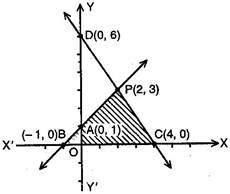
###### ****7. Draw the graphs of the equations x – y + 1 = 0 and 3x + 2y – 12 = 0. Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis, and shade the triangular region.****

**Ans.**For equation x – y + 1 = 0, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image070.png

For equation 3x + 2y – 12 = 0, we have following points which lie on the line

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.2/image071.png



We can see from the graphs that points of intersection of the lines with the x–axis are (–1, 0), (2, 3) and (4, 0).

## NCERT Solutions for Class 10 Maths Pair of Linear Equations in Two Variables

**1. Solve the following pair of linear equations by the substitution method.**

**(i) x + y = 14**

**x – y = 4**

**(ii) s – t = 3**

***http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image001.png***

**(iii) 3x – y = 3**

**9x − 3y = 9**

**(iv)0.2x + 0.3y = 1.3**

**0.4x + 0.5y = 2.3**

**(v) *http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image002.png***

***http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image003.png***

**(vi) *http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image004.png***

***http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image005.png***

**Ans. (i)** x + y = 14 …(1)

x – y = 4 … (2)

x = 4 + y from equation (2)

Putting this in equation (1), we get

4 + y + y = 14

⇒ 2y = 10⇒ y = 5

NCERT Solutions for Class 10 Maths Exercise 3.3

Putting value of y in equation (1), we get

x + 5 = 14

⇒ x = 14 – 5 = 9

Therefore, x = 9 and y = 5

**(ii)** s – t = 3 … (1)

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image001.png* …(2)

Using equation (1), we can say that s = 3 + t

Putting this in equation (2), we get

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image006.png*

⇒ *http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image007.png*

⇒ 5t + 6 = 36

⇒ 5t = 30⇒ t = 6

Putting value of t in equation (1), we get

s – 6 = 3⇒ s = 3 + 6 = 9

Therefore, t = 6 and s = 9

**(iii)** 3x – y = 3 … (1)

9x − 3y = 9 … (2)

Comparing equation 3x – y = 3 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image008.png and equation 9x − 3y = 9 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image009.png,

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image010.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image011.png

Here http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image012.png

Therefore, we have infinite many solutions for x and y

**(iv)** 0.2x + 0.3y = 1.3 … (1)

0.4x + 0.5y = 2.3 … (2)

Using equation (1), we can say that

0.2x = 1.3 − 0.3y

⇒ x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image013.png

Putting this in equation (2), we get

0.4 http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image014.png+ 0.5y = 2.3

⇒ 2.6 − 0.6y + 0.5y = 2.3

⇒ −0.1y = −0.3 ⇒ y = 3

Putting value of y in (1), we get

0.2x + 0.3 (3) = 1.3

⇒ 0.2x + 0.9 = 1.3

⇒ 0.2x = 0.4 ⇒ x = 2

Therefore, x = 2 and y = 3

**(v)** *http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image002.png* ……….(1)

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image003.png* ……….(2)

Using equation (1), we can say that

x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image015.png

NCERT Solutions for Class 10 Maths Exercise 3.3

Putting this in equation (2), we get

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image016.png⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image017.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image018.png⇒ y = 0

Putting value of y in (1), we get x = 0

Therefore, x = 0 and y = 0

**(vi)** http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image004.png … (1)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image005.png … (2)

Using equation (2), we can say that

x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image019.png

⇒ x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image020.png

Putting this in equation (1), we get

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image021.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image022.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image023.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image024.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image025.png ⇒ y = 3

Putting value of y in equation (2), we get

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image026.png*

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image027.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image028.png

⇒ x = 2

Therefore, x = 2 and y = 3

NCERT Solutions for Class 10 Maths Exercise 3.3

###### ****2. Solve 2****x ****+ 3****y ****= 11 and 2****x ****− 4****y ****= −24 and hence find the value of ‘m’ for which****

**y = mx + 3.**

**Ans.**2x + 3y = 11 … (1)

2x − 4y = −24 … (2)

Using equation (2), we can say that

2x = −24 + 4y

⇒ x = −12 + 2y

Putting this in equation (1), we get

2 (−12 + 2y) + 3y = 11

⇒ −24 + 4y + 3y = 11

⇒ 7y = 35 ⇒ y = 5

Putting value of y in equation (1), we get

2x + 3 (5) = 11

⇒ 2x + 15 = 11

⇒ 2x = 11 – 15 = −4⇒ x = −2

Therefore, x = −2 and y = 5

Putting values of x and y in y = mx + 3, we get

5 = m (−2) + 3

⇒ 5 = −2m + 3

⇒ −2m = 2 ⇒ m = −1

NCERT Solutions for Class 10 Maths Exercise 3.3

###### ****3. Form a pair of linear equations for the following problems and find their solution by substitution method.****

**(i) The difference between two numbers is 26 and one number is three times the other. Find them.**

**(ii) The larger of two supplementary angles exceeds the smaller by 18 degrees. Find them.**

**(iii)The coach of a cricket team buys 7 bats and 6 balls for Rs 3800. Later, she buys 3 bats and 5 balls for Rs 1750. Find the cost of each bat and each ball.**

**(iv) The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is Rs 105 and for a journey of 15 km, the charge paid is Rs 155. What are the fixed charges and the charge per km? How much does a person have to pay for travelling a distance of 25 km?**

**(v) A fraction becomes http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image029.png, if 2 is added to both the numerator and the denominator. If, 3 is added to both the numerator and denominator it becomes http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image030.png. Find the fraction.**

**(vi) Five years hence, the age of Jacob will be three times that of his son. Five years ago, Jacob’s age was seven times that of his son. What are their present ages?**

**Ans. (i)** Let first number be x and second number be y.

According to given conditions, we have

x – y = 26 (assuming x > y) … (1)

x = 3y(x > y)… (2)

Putting equation (2) in (1), we get

3y – y = 26

⇒ 2y = 26

⇒ y = 13

Putting value of y in equation (2), we get

x = 3y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image031.png

Therefore, two numbers are 13 and 39.

**(ii)** Let smaller angle =x and let larger angle =y

According to given conditions, we have

y = x + 18 … (1)

Also, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image032.png(Sum of supplementary angles) … (2)

Putting (1) in equation (2), we get

x + x + 18 = 180

⇒ 2x = 180 – 18 = 162

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image033.png

Putting value of x in equation (1), we get

y = x + 18 = 81 + 18 = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image034.png

Therefore, two angles are http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image035.png.

NCERT Solutions for Class 10 Maths Exercise 3.3

**(iii)** Let cost of each bat = Rs x and let cost of each ball = Rs y

According to given conditions, we have

7x + 6y = 3800 … (1)

And,3x + 5y = 1750 … (2)

Using equation (1), we can say that

7x = 3800 − 6y ⇒ x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image036.png

Putting this in equation (2), we get

3 http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image037.png+ 5y = 1750

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image038.png+ 5y = 1750

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image039.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image040.png

⇒ 17y = 850 ⇒ y = 50

Putting value of y in (2), we get

3x + 250 = 1750

⇒ 3x = 1500 ⇒ x = 500

Therefore, cost of each bat = Rs 500 and cost of each ball = Rs 50

**(iv)** Let fixed charge = Rs x and let charge for every km = Rs y

According to given conditions, we have

x + 10y = 105… (1)

x + 15y = 155… (2)

Using equation (1), we can say that

x = 105 − 10y

Putting this in equation (2), we get

105 − 10y + 15y = 155

⇒ 5y = 50 ⇒ y = 10

Putting value of y in equation (1), we get

x + 10 (10) = 105

⇒ x = 105 – 100 = 5

Therefore, fixed charge = Rs 5 and charge per km = Rs 10

To travel distance of 25 Km, person will have to pay = Rs (x + 25y)

= Rs (5 + 25 × 10)

= Rs (5 + 250) = Rs 255

NCERT Solutions for Class 10 Maths Exercise 3.3

**(v)** Let numerator = x and let denominator = y

According to given conditions, we have

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image041.png*… (1)

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image042.png*… (2)

Using equation (1), we can say that

11 (x + 2) = 9y + 18

⇒ 11x + 22 = 9y + 18

⇒ 11x = 9y – 4

⇒ x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image043.png

Putting value of x in equation (2), we get

6 http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image044.png = 5 (y + 3)

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image045.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image046.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image047.png

⇒ y = 9

Putting value of y in (1), we get

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image048.png*

⇒ x + 2 = 9 ⇒ x = 7

Therefore, fraction =http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image049.png

**(vi)** Let present age of Jacob = x years

Let present age of Jacob’s son = y years

According to given conditions, we have

(x + 5) = 3 (y + 5) … (1)

And, (x − 5) = 7 (y − 5) … (2)

From equation (1), we can say that

x + 5 = 3y + 15

⇒ x = 10 + 3y

NCERT Solutions for Class 10 Maths Exercise 3.3

Putting value of x in equation (2) we get

10 + 3y – 5 = 7y − 35

⇒ −4y = −40

⇒ y = 10 years

Putting value of y in equation (1), we get

x + 5 = 3 (10 + 5) = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.3/image050.png

⇒ x = 45 – 5 = 40 years

Therefore, present age of Jacob = 40 years and, present age of Jacob’s son = 10 years

## NCERT Solutions for Class 10 Maths Pair of Linear Equations in Two Variables

**1. Solve the following pair of linear equations by the elimination method and the substitution method:**

**(i) x + y = 5, 2x – 3y = 4**

**(ii) 3x + 4y = 10, 2x – 2y = 2**

**(iii) 3x − 5y – 4 = 0, 9x = 2y + 7**

**(iv) http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image001.png**

**Ans. (i)** x + y = 5 … (1)

2x – 3y = 4 … (2)

**Elimination method:**

Multiplying equation (1) by 2, we get equation (3)

2x + 2y = 10 … (3)

2x − 3y = 4 … (2)

Subtracting equation (2) from (3), we get

5y = 6⇒ y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image002.png

Putting value of y in (1), we get

x + http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image002.png= 5

⇒ x = 5 − http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image002.png= http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image003.png

Therefore, x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image003.png and y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image002.png

###### ****Substitution method:****

x + y = 5 … (1)

2x − 3y = 4 … (2)

From equation (1), we get,

x = 5 − y

Putting this in equation (2), we get

2 (5 − y) − 3y = 4

⇒ 10 − 2y − 3y = 4

⇒ 5y = 6 ⇒ y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image002.png

Putting value of y in (1), we get

x = 5 − http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image002.png= http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image003.png

Therefore, x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image003.png and y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image002.png

**(ii)** 3x + 4y = 10… (1)

2x – 2y = 2… (2)

**Elimination method:**

Multiplying equation (2) by 2, we get (3)

4x − 4y = 4 … (3)

3x + 4y = 10 … (1)

Adding (3) and (1), we get

7x = 14⇒ x = 2

Putting value of x in (1), we get

3 (2) + 4y = 10

⇒ 4y = 10 – 6 = 4

⇒ y = 1

Therefore, x = 2 and y = 1

**Substitution method:**

3x + 4y = 10… (1)

2x − 2y = 2… (2)

From equation (2), we get

2x = 2 + 2y

⇒ x = 1 + y … (3)

Putting this in equation (1), we get

3 (1 + y) + 4y = 10

⇒ 3 + 3y + 4y = 10

⇒ 7y = 7⇒ y = 1

Putting value of y in (3), we get x = 1 + 1 = 2

Therefore, x = 2 and y = 1

**(iii)** 3x − 5y – 4 = 0 … (1)

9x = 2y + 7… (2)

**Elimination method:**

Multiplying (1) by 3, we get (3)

9x − 15y – 12 = 0… (3)

9x − 2y – 7 = 0… (2)

Subtracting (2) from (3), we get

−13y – 5 = 0

⇒ −13y = 5

⇒ y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image004.png

Putting value of y in (1), we get

3x – 5 http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image005.png− 4 = 0

⇒ 3x = 4 − http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image006.png= http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image007.png

⇒ x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image008.png

Therefore, x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image009.png and y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image004.png

NCERT Solutions for Class 10 Maths Exercise 3.4

###### ****Substitution Method:****

3x − 5y – 4 = 0 … (1)

9x = 2y + 7… (2)

From equation (1), we can say that

3x = 4 + 5y⇒ x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image010.png

Putting this in equation (2), we get

9 http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image011.png− 2y = 7

⇒ 12 + 15y − 2y = 7

⇒ 13y = −5 ⇒ y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image004.png

Putting value of y in (1), we get

3x – 5 http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image005.png= 4

⇒ 3x = 4 − http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image006.png= http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image007.png

⇒ x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image008.png

Therefore, x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image009.png and y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image004.png

**(iv)** http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image012.png… (1)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image013.png… (2)

NCERT Solutions for Class 10 Maths Exercise 3.4

###### ****Elimination method:****

Multiplying equation (2) by 2, we get (3)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image014.png… (3)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image012.png… (1)

Adding (3) and (1), we get

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image015.png ⇒ x = 2

Putting value of x in (2), we get

2 − http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image016.png= 3

⇒ y = −3

Therefore, x = 2 and y = −3

NCERT Solutions for Class 10 Maths Exercise 3.4

###### ****Substitution method:****

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image012.png… (1)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image013.png… (2)

From equation (2), we can say that http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image017.png

Putting this in equation (1), we get

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image018.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image019.png

⇒ 5y + 9 = −6

⇒ 5y = −15⇒ y = −3

Putting value of y in (1), we get

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image020.png*⇒ x = 2

Therefore, x = 2 and y = −3

NCERT Solutions for Class 10 Maths Exercise 3.4

###### ****2. Form the pair of linear equations in the following problems, and find their solutions (if they exist) by the elimination method:****

**(i) If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes ½ if we only add 1 to the denominator. What is the fraction?**

**(ii) Five years ago, Nuri was thrice as old as sonu. Ten years later, Nuri will be twice as old as sonu. How old are Nuri and Sonu?**

**(iii) The sum of the digits of a two–digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.**

**(iv) Meena went to a bank to withdraw Rs 2000. She asked the cashier togive her Rs 50 and Rs 100 notes only. Meena got 25 notes in all. Find how many notes of Rs 50 and Rs 100 she received.**

**(v) A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs 27 for a book kept for seven days, while Susy paid Rs 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.**

**Ans. (i)** Let numerator =x and let denominator =y

According to given condition, we have

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image021.png*

⇒ x + 1 = y – 1 and 2x = y + 1

⇒ x – y = −2 … **(1)** and 2x – y = 1… **(2)**

So, we have equations **(1)** and **(2)**, multiplying equation **(1)** by 2 we get **(3)**

2x − 2y = −4… **(3)**

2x – y = 1… **(2)**

Subtracting equation **(2)** from **(3)**, we get

−y = −5⇒ y = 5

Putting value of y in **(1)**, we get

x – 5 = −2⇒ x = −2 + 5 = 3

Therefore, fraction = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.4/image022.png

NCERT Solutions for Class 10 Maths Exercise 3.4

**(ii)**Let present age of Nuri = x years and let present age of Sonu = y years

5 years ago, age of Nuri = (x – 5) years

5 years ago, age of Sonu = (y – 5) years

According to given condition, we have

(x − 5) = 3 (y − 5)

⇒ x – 5 = 3y – 15

⇒ x − 3y = −10… **(1)**

10 years later from present, age of Nuri = (x + 10) years

10 years later from present, age of Sonu = (y + 10) years

According to given condition, we have

(x + 10) = 2 (y + 10)

⇒ x + 10 = 2y + 20

⇒ x − 2y = 10 … **(2)**

Subtracting equation **(1)** from **(2)**, we get

y = 10 − (−10) = 20 years

Putting value of **y** in **(1)**, we get

x – 3 (20) = −10

⇒ x – 60 = −10

⇒ x = 50 years

Therefore, present age of Nuri = 50 years and present age of Sonu = 20 years

NCERT Solutions for Class 10 Maths Exercise 3.4

**(iii)**Let digit at ten’s place = x and Let digit at one’s place = y

According to given condition, we have

x + y = 9 … **(1)**

And 9 (10x + y) = 2 (10y + x)

⇒ 90x + 9y = 20y + 2x

⇒ 88x = 11y

⇒ 8x = y

⇒ 8x – y = 0 … **(2)**

Adding **(1)** and **(2)**, we get

9x = 9⇒ x = 1

Putting value of **x** in **(1)**, we get

1 + y = 9

⇒ y = 9 – 1 = 8

Therefore, number = 10x + y = 10 (1) + 8 = 10 + 8 = 18

NCERT Solutions for Class 10 Maths Exercise 3.4

**(iv)**Let number of Rs 100 notes = x and let number of Rs 50 notes = y

According to given conditions, we have

x + y = 25 … **(1)**

and 100x + 50y = 2000

⇒ 2x + y = 40 … **(2)**

Subtracting **(2)** from **(1)**, we get

−x = −15⇒ x = 15

Putting value of **x** in **(1)**, we get

15 + y = 25

⇒ y = 25 – 15 = 10

Therefore, number of Rs 100 notes = 15 and number of Rs 50 notes = 10

**(v)**Let fixed charge for 3 days = Rs x

Let additional charge for each day thereafter = Rs y

According to given condition, we have

x + 4y = 27 … **(1)**

x + 2y = 21 … **(2)**

Subtracting **(2)** from **(1)**, we get

2y = 6⇒ y = 3

Putting value of **y** in **(1)**, we get

x + 4 (3) = 27

⇒ x = 27 – 12 = 15

Therefore, fixed charge for 3 days = Rs 15 and additional charge for each day after 3 days = Rs 3

## NCERT Solutions for Class 10 Maths Pair of Linear Equations in Two Variables

###### ****1. Which of the following pairs of linear equations has unique solution, no solution, or infinitely many solutions? In case there is a unique solution, find it by using cross multiplication method.****

**(i) x – 3y – 3 = 0**

**3x – 9y – 2 = 0**

**(ii)2x + y = 5**

**3x + 2y = 8**

**(iii) 3x − 5y = 20**

**6x − 10y = 40**

**(iv) x − 3y – 7 = 0**

**3x − 3y – 15 = 0**

**Ans. (i)**x − 3y – 3 = 0

3x − 9y – 2 = 0

Comparing equation x − 3y – 3 = 0 with a1x +b1y + c1 = 0 and 3x − 9y – 2 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image001.png,

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image002.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image003.png

Here http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image004.pngthis means that the two lines are parallel.

Therefore, there is no solution for the given equations i.e. it is inconsistent.

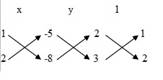
**(ii)**2x + y = 5

3x + 2y = 8

Comparing equation 2x + y = 5 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image005.png and 3x + 2y = 8 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image001.png,

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image006.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image007.png

###### Herehttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image008.pngthis means that there is unique solution for the given equations.



http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image010.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image011.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image012.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image013.png

⇒ x = 2 and y = 1

NCERT Solutions for Class 10 Maths Exercise 3.5

**(iii)**3x − 5y = 20

6x − 10y = 40

Comparing equation 3x − 5y = 20 with *http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image005.png*and 6x − 10y = 40 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image001.png,

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image014.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image015.png

Here http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image016.png

It means lines coincide with each other.

Hence, there are infinite many solutions.

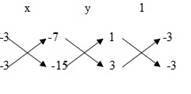
**(iv)**x − 3y – 7 = 0

3x − 3y – 15 = 0

Comparing equation x − 3y – 7 = 0 with *http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image005.png* and 3x − 3y – 15 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image001.png,

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image017.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image018.png

Here http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image008.pngthis means that we have unique solution for these equations.



http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image020.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image021.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image022.png

⇒ x = 4 and y = –1

NCERT Solutions for Class 10 Maths Exercise 3.5

###### ****2. (i) For which values of a and b does the following pair of linear equations have an****

**infinite number of solutions?**

**2x + 3y = 7**

**(a − b) x + (a + b) y = 3a + b – 2**

**(ii) For which value of k will the following pair of linear equations have no**

**solution?**

**3x + y = 1**

**(2k − 1) x + (k − 1) y = 2k + 1**

**Ans. (i)** Comparing equation 2x + 3y – 7 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image005.png and (a − b) x + (a + b)

y − 3a – b + 2 = 0 with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image001.png

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image023.pngand http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image024.png and http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image025.png

###### Linear equations have infinite many solutions if http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image016.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image026.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image027.png

⇒ 2a + 2b = 3a − 3b and 6 − 3b − 9a = −7a − 7b

⇒ a = 5b… (1) and −2a = −4b – 6… (2)

Putting (1) in (2), we get

−2 (5b) = −4b – 6

⇒ −10b + 4b = −6

⇒ −6b = –6 ⇒ b = 1

Putting value of b in (1), we get

a = 5b = 5 (1) = 5

Therefore, a = 5 and b = 1

**(ii)** Comparing (3x + y – 1 = 0) with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image005.png and (2k − 1)x + (k − 1)y −2k – 1 = 0) with http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image001.png,

We get http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image028.png and http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image029.png and c2 = −2k − 1

Linear equations have no solution if http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image004.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image030.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image031.png

⇒ 3 (k − 1) = 2k – 1

⇒ 3k – 3 = 2k − 1

⇒ k = 2

NCERT Solutions for Class 10 Maths Exercise 3.5

###### ****3. Solve the following pair of linear equations by the substitution and cross-multiplication methods:****

**8x + 5y = 9**

**3x + 2y = 4**

**Ans. Substitution Method**

8x + 5y = 9 … **(1)**

3x + 2y = 4 … **(2)**

From equation **(1)**,

5y = 9 − 8x⇒ y = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image032.png

NCERT Solutions for Class 10 Maths Exercise 3.5

Putting this in equation **(2)**, we get

3x + 2 http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image033.png= 4

⇒ 3x + http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image034.png = 4

⇒ 3x − http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image035.png

⇒ 15x − 16x = 20 – 18

⇒ x = −2

Putting value of **x** in**(1)**, we get

8 (−2) + 5y = 9

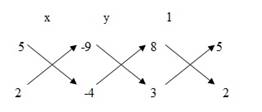
⇒ 5y = 9 + 16 = 25⇒ y = 5

Therefore, x = −2 and y = 5

###### ****Cross multiplication method****

8x + 5y = 9 … **(1)**

3x + 2y = 4 … **(2)**



http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image037.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image038.png

⇒ http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image039.png

⇒ x = −2 and y = 5

NCERT Solutions for Class 10 Maths Exercise 3.5

###### ****4. Form the pair of linear equations in the following problems and find their solutions (if they exist) by any algebraic method:****

**(i) A part of monthly hostel charges is fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 20 days she has to pay Rs 1000 as hostel charges whereas a student B, who takes food for 26 days, pays Rs 1180 as hostel charges. Find the fixed charges and the cost of food per day.**

**(ii) A fraction becomes http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image040.pngwhen 1 is subtracted from the numerator and it becomes http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image041.png when 8 is added to its denominator. Find the fraction.**

**(iii) Yash scored 40 marks in a test, getting 3 marks for each right 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 incorrect answer, then Yash would have scored 50 marks. How many questions were there in the test?**

**(iv) Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars?**

**(v) The area of a rectangle gets reduced by 9 square units, if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and the breadth by 2 units, the area increases by 67 square units. Find the dimensions of the rectangle.**

**Ans.(i)**Let fixed monthly charge = Rs x and let charge of food for one day = Rs y

According to given conditions,

x + 20y = 1000 … (1),

and x + 26y = 1180 … (2)

Subtracting equation (1) from equation (2), we get

6y = 180

⇒ y = 30

Putting value of y in (1), we get

x + 20 (30) = 1000

⇒ x = 1000 – 600 = 400

Therefore, fixed monthly charges = Rs 400 and, charges of food for one day = Rs 30

**(ii)** Let numerator = x and let denominator = y

According to given conditions,

*http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image042.png*

⇒ 3x – 3 = y … (1) 4x = y + 8 … (1)

⇒ 3x – y = 3 … (1) 4x – y = 8 … (2)

Subtracting equation (1) from (2), we get

4x – y − (3x − y) = 8 – 3

⇒ x = 5

Putting value of x in (1), we get

3 (5) – y = 3

⇒ 15 – y = 3

⇒ y = 12

Therefore, numerator = 5 and, denominator = 12

It means fraction =

NCERT Solutions for Class 10 Maths Exercise 3.5

**(iii)** Let number of correct answers = x and let number of wrong answers = y

According to given conditions,

3x – y = 40 … (1)

And, 4x − 2y = 50 … (2)

From equation (1), y = 3x − 40

Putting this in (2), we get

4x – 2 (3x − 40) = 50

⇒ 4x − 6x + 80 = 50

⇒ −2x = −30

⇒ x = 15

Putting value of x in (1), we get

3 (15) – y = 40

⇒ 45 – y = 40

⇒ y = 45 – 40 = 5

Therefore, number of correct answers = x = 15and number of wrong answers = y = 5

Total questions = x + y = 15 + 5 = 20

**(iv)**Let speed of car which starts from part A = x km/hr

Let speed of car which starts from part B = y km/hr

According to given conditions,

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image044.png(Assuming x > y)

⇒ 5x − 5y = 100

⇒ x – y = 20 … (1)

And, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image045.png

⇒ x + y = 100 … (2)

Adding (1) and (2), we get

2x = 120

⇒ x = 60 km/hr

Putting value of x in (1), we get

60 – y = 20

⇒ y = 60 – 20 = 40 km/hr

Therefore, speed of car starting from point A = 60 km/hr

And, Speed of car starting from point B = 40 km/hr

**(v)** Let length of rectangle = x units and Let breadth of rectangle = y units

Area =xy square units. According to given conditions,

NCERT Solutions for Class 10 Maths Exercise 3.5

xy – 9 = (x − 5) (y + 3)

⇒ xy – 9 = xy + 3x − 5y – 15

⇒ 3x − 5y = 6 … (1)

And, xy + 67 = (x + 3) (y + 2)

⇒ xy + 67 = xy + 2x + 3y + 6

⇒ 2x + 3y = 61 … (2)

From equation (1),

3x = 6 + 5y

⇒ x = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image046.png

Putting this in (2), we get

2 http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.5/image047.png+ 3y = 61

⇒ 12 + 10y + 9y = 183

⇒ 19y = 171

⇒ y = 9 units

Putting value of y in (2), we get

2x + 3 (9) = 61

⇒ 2x = 61 – 27 = 34

⇒ x = 17 units

Therefore, length = 17 units and, breadth = 9 units

**NCERT Solutions for Class 10 Maths Pair of Linear Equations in Two Variables**

**1. Solve the following pairs of equations by reducing them to a pair of linear equations:**

**(i)**

**(ii)**

**(iii) + 3y = 14**

**− 4y = 23**

**(iv)**

**NCERT Solutions for Class 10 Maths Exercise 3.6**

**(v) 7x − 2y = 5xy**

**8x + 7y = 15xy**

**(vi) 6x + 3y − 6xy = 0**

**2x + 4y − 5xy = 0**

**(vii)**

**(viii)**

**Ans. (i) … (1)**

**… (2)**

**Let = p and = q**

**Putting this in equation (1) and (2), we get**

**⇒ 3p + 2q = 12 and 6 (2p + 3q) = 13 (6)**

**⇒ 3p + 2q = 12 and 2p + 3q =13**

**⇒ 3p + 2q – 12 = 0 … (3) and 2p + 3q – 13 = 0 … (4)**

**1**

**⇒**

**⇒**

**⇒**

**⇒ p = 2 and q = 3**

**But = p and = q**

**Putting value of p and q in this we get**

**x = and y =**

**(ii) … (1)**

**… (2)**

**Let = p and = q**

**Putting this in (1) and (2), we get**

**2p + 3q = 2 … (3)**

**4p − 9q = −1 … (4)**

**Multiplying (3) by 2 and subtracting it from (4), we get**

**4p − 9q + 1 – 2 (2p + 3q − 2) = 0**

**⇒ 4p − 9q + 1 − 4p − 6q + 4 = 0**

**⇒ −15q + 5 = 0**

**⇒ q =**

**Putting value of q in (3), we get**

**2p + 1 = 2 ⇒ 2p = 1⇒ p = ½**

**Putting values of p and q in (= p and = q), we get**

**and**

**⇒**

**⇒ x = 4 and y = 9**

**NCERT Solutions for Class 10 Maths Exercise 3.6**

**(iii) + 3y = 14 … (1)**

**− 4y = 23 … (2) and Let = p … (3)**

**Putting (3) in (1) and (2), we get**

**4p + 3y = 14 … (4)**

**3p − 4y = 23 … (5)**

**Multiplying (4) by 3 and (5) by 4, we get**

**3 (4p + 3y – 14 = 0) and, 4 (3p − 4y – 23 = 0)**

**⇒ 12p + 9y – 42 = 0 … (6) 12p − 16y – 92 = 0 … (7)**

**Subtracting (7) from (6), we get**

**9y − (−16y) – 42 − (−92) = 0**

**⇒ 25y + 50 = 0**

**⇒ y = 50 – 25 = −2**

**Putting value of y in (4), we get**

**4p + 3 (−2) = 14**

**⇒ 4p – 6 = 14**

**⇒ 4p = 20⇒ p = 5**

**Putting value of p in (3), we get**

**= 5 ⇒ x =**

**Therefore, x = and y = −2**

**(iv) … (1)**

**… (2)**

**Let**

**Putting this in (1) and (2), we get**

**5p + q = 2**

**⇒ 5p + q – 2 = 0 … (3)**

**And, 6p − 3q = 1**

**⇒ 6p − 3q – 1 = 0 … (4)**

**Multiplying (3) by 3 and adding it to (4), we get**

**3 (5p + q − 2) + 6p − 3q – 1 = 0**

**⇒ 15p + 3q – 6 + 6p − 3q – 1 = 0**

**⇒ 21p – 7 = 0**

**⇒ p =**

**Putting this in (3), we get**

**5 () + q – 2 = 0**

**⇒ 5 + 3q = 6**

**⇒ 3q = 6 – 5 = 1**

**⇒ q =**

**NCERT Solutions for Class 10 Maths Exercise 3.6**

**Putting values of p and q in (), we get**

**⇒ 3 = x − 1 and 3 = y – 2**

**⇒ x = 4 and y = 5**

**(v) 7x − 2y = 5xy … (1)**

**8x + 7y = 15xy … (2)**

**Dividing both the equations by xy, we get**

**Let = p and = q**

**Putting these in (3) and (4), we get**

**7q − 2p = 5 … (5)**

**8q + 7p = 15 … (6)**

**From equation (5),**

**2p = 7q – 5**

**⇒ p =**

**Putting value of p in (6), we get**

**8q + 7 () = 15**

**⇒ 16q + 49q – 35 = 30**

**⇒ 65q = 30 + 35 = 65**

**⇒ q = 1**

**Putting value of q in (5), we get**

**7 (1) − 2p = 5**

**⇒ 2p = 2⇒ p = 1**

**NCERT Solutions for Class 10 Maths Exercise 3.6**

**Putting value of p and q in (= p and = q), we get x = 1 and y = 1**

**(vi) 6x + 3y − 6xy = 0 … (1)**

**2x + 4y − 5xy = 0 … (2)**

**Dividing both the equations by xy, we get**

**Let = p and = q**

**Putting these in (3) and (4), we get**

**6q + 3p – 6 = 0 … (5)**

**2q + 4p – 5 = 0 … (6)**

**From (5),**

**3p = 6 − 6q**

**⇒ p = 2 − 2q**

**Putting this in (6), we get**

**2q + 4 (2 − 2q) – 5 = 0**

**⇒ 2q + 8 − 8q – 5 = 0**

**⇒ −6q = −3⇒ q = ½**

**Putting value of q in (p = 2 – 2q), we get**

**p = 2 – 2 (½) = 2 – 1 = 1**

**NCERT Solutions for Class 10 Maths Exercise 3.6**

**Putting values of p and q in (= p and = q), we get x = 1 and y = 2**

**(vii) … (1)**

**…(2)**

**Let**

**Putting this in (1) and (2), we get**

**10p + 2q = 4 … (3)**

**15p − 5q = −2 … (4)**

**From equation (3),**

**2q = 4 − 10p**

**⇒ q = 2 − 5p … (5)**

**Putting this in (4), we get**

**15p – 5 (2 − 5p) = −2**

**⇒ 15p – 10 + 25p = −2**

**⇒ 40p = 8⇒ p =**

**Putting value of p in (5), we get**

**q = 2 – 5 () = 2 – 1 = 1**

**Putting values of p and q in (), we get**

**⇒ x + y = 5 … (6) and x – y = 1 … (7)**

**Adding (6) and (7), we get**

**2x = 6 ⇒ x = 3**

**Putting x = 3 in (7), we get**

**3 – y = 1**

**⇒ y = 3 – 1 = 2**

**Therefore, x = 3 and y = 2**

**NCERT Solutions for Class 10 Maths Exercise 3.6**

**(viii) … (1)**

**… (2)**

**Let**

**Putting this in (1) and (2), we get**

**p + q = and**

**⇒ 4p + 4q = 3 … (3) and 4p − 4q = −1 … (4)**

**Adding (3) and (4), we get**

**8p = 2 ⇒ p = ¼**

**Putting value of p in (3), we get**

**4 (¼) + 4q = 3**

**⇒ 1 + 4q = 3**

**⇒ 4q = 3 – 1 = 2**

**⇒ q = ½**

**Putting value of p and q in , we get**

**⇒ 3x + y = 4 … (5) and 3x – y = 2 … (6)**

**Adding (5) and (6), we get**

**6x = 6 ⇒ x = 1**

**Putting x = 1 in (5) , we get**

**3 (1) + y = 4**

**⇒ y = 4 – 3 = 1**

**Therefore, x = 1 and y = 1**

**NCERT Solutions for Class 10 Maths Exercise 3.6**

**2. Formulate the following problems as a part of equations, and hence find their solutions.**

**(i) Ritu can row downstream 20 km in 2 hours, and upstream 4 km in 2 hours. Find her speed of rowing in still water and the speed of the current.**

**(ii) 2 women and 5 men can together finish an embroidery work in 4 days, while 3 women and 6 men can finish it in 3 days.Find the time taken by 1 woman alone to finish the work, and also that taken by 1 man alone.**

**(iii) Roohi travels 300 km to her home partly by train and partly by bus. She takes 4 hours if she travels 60 km by train and the remaining by bus. If she travels 100 km by train and the remaining by bus, she takes 10 minutes longer. Find the speed of the train and the bus separately.**

**Ans. (i) Let speed of rowing in still water = x km/h**

**Let speed of current = y km/h**

**So, speed of rowing downstream = (x + y) km/h**

**And, speed of rowing upstream = (x − y) km/h**

**According to given conditions,**

**⇒ 2x + 2y = 20 and 2x − 2y = 4**

**⇒ x + y = 10 … (1) and x – y = 2 … (2)**

**Adding (1) and (2), we get**

**2x = 12⇒ x = 6**

**Putting x = 6 in (1), we get**

**6 + y = 10**

**⇒ y = 10 – 6 = 4**

**Therefore, speed of rowing in still water = 6 km/h**

**Speed of current = 4 km/h**

**NCERT Solutions for Class 10 Maths Exercise 3.6**

**(ii) Let time taken by 1 woman alone to finish the work = x days**

**Let time taken by 1 man alone to finish the work = y days**

**So, 1 woman’s 1-day work = ()th part of the work**

**And, 1 man’s 1-day work = ()th part of the work**

**So, 2 women’s 1-day work = ()th part of the work**

**And, 5 men’s 1-day work = ()th part of the work**

**Therefore, 2 women and 5 men’s 1-day work = (+)th part of the work… (1)**

**It is given that 2 women and 5 men complete work in = 4 days**

**It means that in 1 day, they will be completing th part of the work … (2)**

**Clearly, we can see that (1) = (2)**

**⇒ … (3)**

**Similarly, … (4)**

**Let**

**Putting this in (3) and (4), we get**

**2p + 5q = and 3p + 6q =**

**⇒ 8p + 20q = 1 … (5) and 9p + 18q = 1 … (6)**

**Multiplying (5) by 9 and (6) by 8, we get**

**72p + 180q = 9 … (7)**

**72p + 144q = 8 … (8)**

**Subtracting (8) from (7), we get**

**36q = 1⇒ q =**

**Putting this in (6), we get**

**9p + 18 () = 1**

**⇒ 9p = ½⇒ p =**

**Putting values of p and q in , we get x = 18 and y = 36**

**Therefore, 1 woman completes work in = 18 days**

**And, 1 man completes work in = 36 days**

**NCERT Solutions for Class 10 Maths Exercise 3.6**

**(iii) Let speed of train = x km/h and let speed of bus = y km/h**

**According to given conditions,**

**Let**

**Putting this in the above equations, we get**

**60p + 240q = 4 … (1)**

**And 100p + 200q = … (2)**

**Multiplying (1) by 5 and (2) by 3, we get**

**300p + 1200q = 20 … (3)**

**300p + 600q = … (4)**

**Subtracting (4) from (3), we get**

**600q = 20 − = 7.5**

**⇒ q =**

**Putting value of q in (2), we get**

**100p + 200 () =**

**⇒ 100p + 2.5 =**

**⇒ 100p = – 2.5**

**⇒ p =**

**But**

**Therefore, x =km/h and y = km/h**

**Therefore, speed of train = 60 km/h**

**And, speed of bus = 80 km/h**

## NCERT Solutions for Class 10 Maths Pair of Linear Equations in Two Variables

###### ****1. The age of two friends Ani and Biju differ by 3 years. Ani’s father Dharam is twice as old as Ani and Biju is twice as old as his sister Cathy. The ages of Cathy and Dharam differ by 30 years. Find the ages of Ani and Biju.****

**Ans.**Let the age of Ani and Biju be x years and y years respectively.

Age of Dharam = 2x years and Age of Cathy = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image001.png years  
According to question, x – y = 3… (1)

Andhttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image002.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png4x – y = 60… (2)

Subtracting (1) from (2), we obtain:  
3x = 60 – 3 = 57

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png x = Age of Ani = 19 years

Age of Biju = 19 – 3 = 16 years  
Again, According to question, y – x = 3… (3)

Andhttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image002.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png4x – y = 60… (4)

Adding (3) and (4), we obtain:

3x = 63

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png x = 21  
Age of Ani = 21 years  
Age of Biju = 21 + 3 = 24 years

NCERT Solutions for Class 10 Maths Exercise 3.7

###### ****2. One says, “Give me a hundred, friend! I shall then become twice as rich as you.” The other replies, “If you give me ten, I shall be six times as rich as you.” Tell me what is the amount of their (respective) capital? [From the Bijaganita of Bhaskara II]****

**Ans.**Let the money with the first person and second person be Rs x and Rs y respectively.  
According to the question,

x + 100 = 2(y – 100)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pngx + 100 = 2y – 200

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png x – 2y = – 300… (1)

Again, 6(x – 10) = (y + 10)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 6x – 60 = y + 10

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 6x – y = 70… (2)

Multiplying equation (2) by 2, we obtain:

12x – 2y = 140… (3)

Subtracting equation (1) from equation (3), we obtain:

11x = 140 + 300

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 11x = 440

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png x = 40

Putting the value of x in equation (1), we obtain:

40 – 2y = –300

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 40 + 300 = 2y

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 2y = 340

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png y = 170

Thus, the two friends had Rs 40 and Rs 170 with them.

NCERT Solutions for Class 10 Maths Exercise 3.7

###### ****3. A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/h, it would have taken 3 hours more than the scheduled time. Find the distance covered by the train.****

**Ans.**Let the speed of the train be x km/h and the time taken by train to travel the given distance be t hours and the distance to travel be d km.

Since Speed = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image004.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image005.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image006.png… (1)  
According to the question

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image007.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image008.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image009.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image010.png……(2)[Using eq. (1)]

Again, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image011.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image012.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image013.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image014.png……(3)[Using eq. (1)]

Adding equations (2) and (3), we obtain:  
x = 50  
Substituting the value of x in equation (2), we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image015.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png –100 + 10t = 20

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 10t = 120t = 12

From equation (1), we obtain:

d = xt = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image016.png= 600

Thus, the distance covered by the train is 600 km.

NCERT Solutions for Class 10 Maths Exercise 3.7

###### ****4. The students of a class are made to stand in rows. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. Find the number of students in the class.****

**Ans.**Let the number of rows be x and number of students in a row be y.  
Total number of students in the class = Number of rows x Number of students in a row = xy

According to the question,

Total number of students = (x – 1) (y + 3)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pngxy = (x – 1) (y + 3)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png xy = xy – y + 3x – 3

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 3x – y – 3 = 0

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 3x – y = 3… (1)

Total number of students = (x + 2) (y – 3)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pngxy = xy + 2y – 3x – 6

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 3x – 2y = –6… (2)  
Subtracting equation (2) from (1), we obtain:  
y = 9  
Substituting the value of y in equation (1), we obtain:  
3x – 9 = 3

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png 3x = 9 + 3 = 12

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png x = 4

Number of rows = x = 4

Number of students in a row = y = 9  
Hence, Total number of students in a class = xy = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image017.png

NCERT Solutions for Class 10 Maths Exercise 3.7

###### ****5. In a****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image018.png****ABC,****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.png****C = 3****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.png****B = 2(****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.png****A +****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.png****B). Find three angles.****

**Ans.**http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngC = 3http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB = 2(http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA + http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB)

Taking 3http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB = 2(http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA + http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB = 2http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png2http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA – http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB = 0 …….(1)

We know that the sum of the measures of all angles of a triangle is 180°.

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA + http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB + http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngC = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image020.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA + http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB + 3http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image020.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA + 4http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image021.png…….(2)

Multiplying equation (1) by 4, we obtain:

8http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA – 4http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB = 0 …….(3)

Adding equations (2) and (3), we get

9http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image021.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image022.png

From eq. (2), we get,

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image023.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image024.png

Andhttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngC = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image025.png

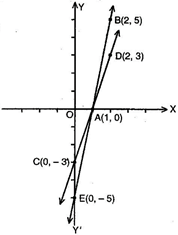
Hence the measures of http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA, http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB and http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngC are http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image026.pngrespectively.

NCERT Solutions for Class 10 Maths Exercise 3.7

###### ****6. Draw the graphs of the equations****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image027.png****and****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image028.png****Determine the co-ordinate of the vertices of the triangle formed by these lines and the****http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image029.png****axis.****

**Ans.**http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image027.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image030.png

Three solutions of this equation can be written in a table as follows:  


http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image032.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image033.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image034.pngX’

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image035.png

It can be observed that the required triangle is http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image018.pngABC.  
The coordinates of its vertices are A (1, 0), B (0, –3), C (0, –5).

NCERT Solutions for Class 10 Maths Exercise 3.7

###### ****7. Solve the following pair of linear equations:****

**(i)http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image036.png**

**http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image037.png**

**(ii) http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image038.png**

**http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image039.png**

**(iii)http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image040.png**

**http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image041.png**

**(iv) http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image042.png**

**http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image043.png**

**(v) http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image044.png**

**http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image045.png**

**Ans. (i)** http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image046.png… (1)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image037.png… (2)  
Multiplying equation (1) by p and equation (2) by q, we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image047.png … (3)  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image048.png… (4)  
Adding equations (3) and (4), we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image049.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image050.png  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image051.png = 1

Substituting the value of http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image052.png in equation (1), we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image053.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image054.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image055.png

Hence the required solution is x = 1 and y = –1.

**(ii)**http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image038.png… (1)  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image039.png … (2)  
Multiplying equation (1) by a and equation (2) by b, we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image056.png… (3)  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image057.png … (4)  
Subtracting equation (4) from equation (3),  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image058.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image059.png  
Substituting the value of x in equation (1), we obtain:

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image060.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image061.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image062.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image063.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image064.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image065.png

**(iii)** http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image040.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image066.png……..(1)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image041.png……..(2)

Multiplying equation (1) and (2) by b and a respectively, we obtain:

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image067.png ……..(3)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image068.png……..(4)

Adding equations (3) and (4), we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image069.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image070.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image071.png  
Substituting the value of http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image052.png in equation (1), we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image072.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image073.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image074.png

**(iv)** http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image042.png … (1)

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image043.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image075.png ……..(2)  
Subtracting equation (2) from (1), we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image076.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image077.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image078.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image079.png  
Substituting the value of http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image052.png in equation (1), we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image080.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image081.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image082.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image083.png

**(v)**152x – 378y = –74… (1)  
–378x + 152y = –604 … (2)  
Adding the equations (1) and (2), we obtain:  
–226x – 226y = –678

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pngx + y = 3 ………(3)

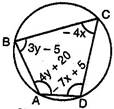
Subtracting the equation (2) from equation (1), we obtain:  
530x – 530y = 530

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pngx – y = 1 ……..(4)  
Adding equations (3) and (4), we obtain:  
2x = 4

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pngx = 2  
Substituting the value of x in equation (3), we obtain:  
y = 1

NCERT Solutions for Class 10 Maths Exercise 3.7

###### ****8. ABCD is a cyclic quadrilateral (see figure). Find the angles of the cyclic quadrilateral.****

****

**Ans.**We know that the sum of the measures of opposite angles in a cyclic quadrilateral is http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image020.png.

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image085.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA + http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngC = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image020.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image086.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image087.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image088.png………(1)

Also http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB + http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngD = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image020.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image089.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image090.png………(2)

Multiplying equation (1) by 3, we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image091.png ……….(3)

Adding equations (2) and (3), we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image092.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image093.png  
Substituting the value of http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image052.png in equation (1), we obtain:  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image094.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image003.png http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image095.png  
http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image085.pnghttp://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngA = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image096.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngB = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image097.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngC = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image098.png

http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image019.pngD = http://media.mycbseguide.com/images/static/ncert/10/mathematics/ch03/Ex3.7/image099.png