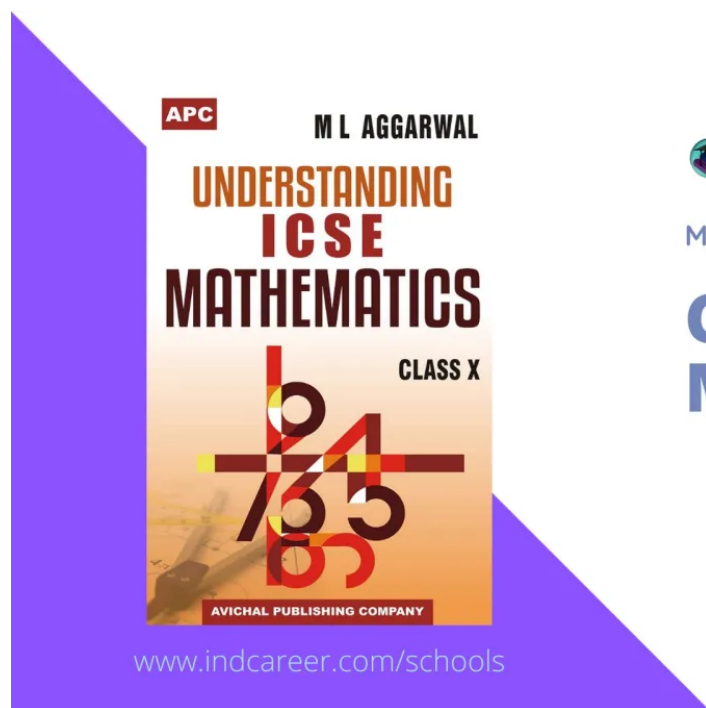


ML Aggarwal Solutions for Class 10 Maths Chapter

4- Linear Inequations



ML Agrawal Solutions

CLASS 10 MATHS

Chapter 4: Linear
Inequations

For any clarifications or questions you can write to info@indcareer.com

Postal Address

IndCareer.com, 52, Shilpa Nagar, Somalwada Nagpur - 440015
Maharashtra, India

WhatsApp: +91 9561 204 888, **Website:** <https://www.indcareer.com> Class 8: Biology
Chapter 6 solutions. Complete Class 8 Biology Chapter 6 Notes.

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>



ML Aggarwal Solutions for Class 10 Maths

Chapter 4- Linear Inequations

Class 10: Maths Chapter 4 solutions. Complete Class 10 Maths Chapter 4 Notes.

ML Aggarwal Solutions for Class 10 Maths Chapter 4- Linear Inequations

ML Aggarwal 10th Maths Chapter 4, Class 10 Maths Chapter 4 solutions

Exercise 4

1. Solve the inequation, $3x - 11 < 3$ where $x \in \{1, 2, 3, \dots, 10\}$. Also, represent its solution on a number line.

Solution:

Given inequation, $3x - 11 < 3$

$$3x < 3 + 11$$

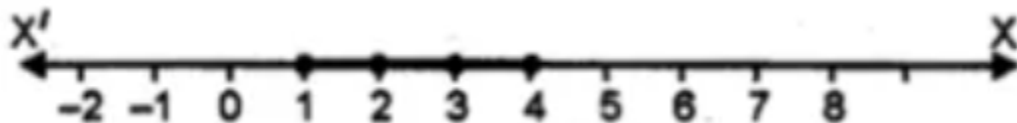
$$3x < 14$$

$$\Rightarrow x < 14/3$$

But, $x \in \{1, 2, 3, \dots, 10\}$

Hence, the solution set is $\{1, 2, 3, 4\}$.

Representing the solution on a number line:



<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

2. Solve $2(x - 3) < 1$, $x \in \{1, 2, 3, \dots, 10\}$

Solution:

Given inequation, $2(x - 3) < 1$

$$2x - 6 < 1$$

$$2x < 7$$

$$\Rightarrow x < 7/2$$

But, $x \in \{1, 2, 3, \dots, 10\}$

Hence, the solution set is $\{1, 2, 3\}$

3. Solve $5 - 4x > 2 - 3x$, $x \in W$. Also represent its solution on the number line.

Solution:

Given inequation, $5 - 4x > 2 - 3x$

$$-4x + 3x > 2 - 5$$

$$-x > -3$$

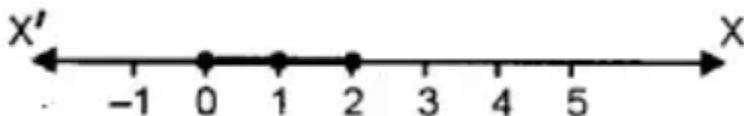
On multiplying both sides by -1 , the inequality reverses

$$\Rightarrow x < 3$$

Since, $x \in W$

The solution set is $\{0, 1, 2\}$

Representing the solution on a number line:



4. List the solution set of $30 - 4(2x - 1) < 30$, given that x is a positive integer.

Solution:

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

Given inequation, $30 - 4(2x - 1) < 30$

$$30 - 8x + 4 < 30$$

$$34 - 8x < 30$$

$$-8x < 30 - 34$$

$$-8x < -4 \text{ [On multiplying both sides by -1, the inequality reverses]}$$

$$8x > 4$$

$$x > 4/8$$

$$\Rightarrow x > 1/2$$

As x is a positive integer

The solution set is $\{1, 2, 3, \dots\}$

5. Solve: $2(x - 2) < 3x - 2$, $x \in \{-3, -2, -1, 0, 1, 2, 3\}$.

Solution:

Given inequation, $2(x - 2) < 3x - 2$

$$2x - 4 < 3x - 2$$

$$2x - 3x < -2 + 4$$

$$-x < 2$$

$$\Rightarrow x > -2$$

But, $x \in \{-3, -2, -1, 0, 1, 2, 3\}$

Hence, the solution set is $\{-1, 0, 1, 2, 3\}$.

6. If x is a negative integer, find the solution set of $2/3 + 1/3(x + 1) > 0$.

Solution:

Given inequation, $2/3 + 1/3(x + 1) > 0$.

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$\frac{2}{3} + \frac{x}{3} + \frac{1}{3} > 0$$

$$\frac{x}{3} + 1 > 0$$

$$\frac{x}{3} > -1$$

$$\Rightarrow x > -3$$

As x is a negative integer

The solution set is $\{-1, -2\}$.

7. Solve $x - 3(2 + x) > 2(3x - 1)$, $x \in \{-3, -2, -1, 0, 1, 2, 3\}$. Also represent its solution on the number line.

Solution:

Given inequation, $x - 3(2 + x) > 2(3x - 1)$

$$x - 6 - 3x > 6x - 2$$

$$-2x - 6 > 6x - 2$$

$$-6x - 2x > -2 + 6$$

$$-8x > 4$$

$$x < -4/8$$

$$\Rightarrow x < -1/2$$

But, $x \in \{-3, -2, -1, 0, 1, 2, 3\}$

Hence, the solution set is $\{-3, -2, -1\}$

8. Given $x \in \{1, 2, 3, 4, 5, 6, 7, 9\}$ solve $x - 3 < 2x - 1$.

Solution:

Given inequation, $x - 3 < 2x - 1$

$$x - 2x < -1 + 3$$

$$-x < 2$$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$\Rightarrow x > -2$$

But, $x \in \{1, 2, 3, 4, 5, 6, 7, 9\}$

Hence, the solution set is $\{1, 2, 3, 4, 5, 6, 7, 9\}$.

9. List the solution set of the inequation $\frac{1}{2} + 8x > 5x - \frac{3}{2}$, $x \in \mathbb{Z}$

Solution:

Given inequation, $\frac{1}{2} + 8x > 5x - \frac{3}{2}$

$$8x - 5x > -\frac{3}{2} - \frac{1}{2}$$

$$3x > -\frac{4}{2}$$

$$\Rightarrow x > -\frac{2}{3}$$

As $x \in \mathbb{Z}$

The solution set is $\{0, 1, 2, 3, 4, 5, \dots\}$

10. List the solution set of $(11 - 2x)/5 \geq (9 - 3x)/8 + \frac{3}{4}$, $x \in \mathbb{N}$

Solution:

Given inequation, $(11 - 2x)/5 \geq (9 - 3x)/8 + \frac{3}{4}$

$$(11 - 2x)/5 \geq (9 - 3x + 6)/8$$

$$8(11 - 2x) \geq 5(15 - 3x)$$

$$88 - 16x \geq 75 - 15x$$

$$15x - 16x \geq 75 - 88$$

$$-x \geq -13$$

$$\Rightarrow x \leq 13$$

As $x \in \mathbb{N}$

Hence, the solution set is $\{1, 2, 3, 4, \dots, 13\}$.

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

11. Find the values of x , which satisfy the inequation : , $x \in \mathbb{N}$. Graph the solution set on the number line.

Solution:

Given inequation,

$$-2 \leq \frac{1}{2} - \frac{2x}{3} \leq 1\frac{5}{6}$$

$$-2 \leq (3 - 4x)/6 \leq 11/6$$

$$-12 \leq 3 - 4x \leq 11$$

$$-12 - 3 \leq -4x \leq 11 - 3$$

$$-15 \leq -4x \leq 8$$

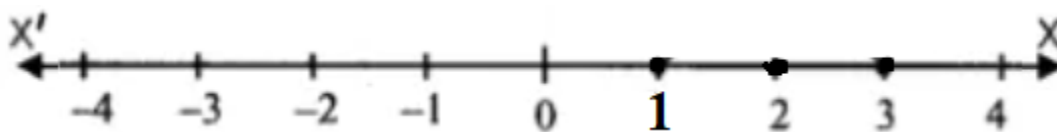
$$-15/4 \leq -x \leq 8/4$$

$$\Rightarrow 15/4 \geq x \geq -2$$

As $x \in \mathbb{N}$,

The solution set is $\{1, 2, 3\}$.

Representing the solution on a number line:



12. If $x \in \mathbb{W}$, find the solution set of $3/5 x - (2x - 1)/3 > 1$. Also graph the solution set on the number line, if possible.

Solution:

Given inequation, $3/5 x - (2x - 1)/3 > 1$

$9/15 x - 5(2x - 1)/15 > 1$ [Taking L.C.M]

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$9x - 5(2x - 1) > 15 \text{ [Multiplying by 15 on both sides]}$$

$$9x - 10x + 5 > 15$$

$$-x > 15 - 5$$

$$-x > 10$$

$$\Rightarrow x < -10$$

But, $x \in W$

Hence, the solution set is a null set.

Thus, it can't be represented on number line.

13. Solve:

(i) $x/2 + 5 \leq x/3 + 6$, where x is a positive odd integer.

(ii) $(2x + 3)/3 \geq (3x - 1)/4$, where x is positive even integer.

Solution:

(i) Given inequation, $x/2 + 5 \leq x/3 + 6$

$$(x + 10)/2 \leq (x + 18)/3 \text{ [Taking L.C.M on both sides]}$$

$$3(x + 10) \leq 2(x + 18) \text{ [On cross-multiplying]}$$

$$3x + 30 \leq 2x + 36$$

$$3x - 2x \leq 36 - 30$$

$$\Rightarrow x \leq 6$$

As x is a positive odd integer.

Hence, the solution set is $\{1, 3, 5\}$.

(ii) Given inequation, $(2x + 3)/3 \geq (3x - 1)/4$

$$4(2x + 3) \geq 3(3x - 1) \text{ [On cross-multiplying]}$$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$8x + 12 \geq 9x - 3$$

$$-9x + 8x \geq -12 - 3$$

$$-x \geq -15$$

$$\Rightarrow x \leq 15$$

As x is positive even integer.

Hence, the solution set is {2, 4, 6, 8, 10, 12, 14}.

14. Given that $x \in I$, solve the inequation and graph the solution on the number line:

$$3 \geq (x - 4)/2 + x/3 \geq 2$$

Solution:

Given inequation, $3 \geq (x - 4)/2 + x/3 \geq 2$

Now, let's take

$$3 \geq (x - 4)/2 + x/3, \text{ we have}$$

$$3 \geq (3x - 12 + 2x)/6 \text{ [Taking L.C.M]}$$

$$18 \geq 5x - 12$$

$$30 \geq 5x$$

$$\Rightarrow x \leq 6 \dots (i)$$

Next,

$$(x - 4)/2 + x/3 \geq 2$$

$$(3x - 12 + 2x)/6 \geq 2$$

$$5x - 12 \geq 12$$

$$5x \geq 24$$

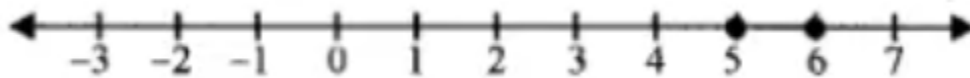
$$x \geq 24/5 \Rightarrow x \geq 4.8 \dots (ii)$$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

Hence, from (i) and (ii) we have

Solution of $x = \{5, 6\}$

Representing the solution on a number line:



15. Solve: $1 \geq 15 - 7x > 2x - 27$, $x \in \mathbb{N}$

Solution:

Given inequation, $1 \geq 15 - 7x > 2x - 27$,

So, we have

$$1 \geq 15 - 7x \text{ and } 15 - 7x > 2x - 27$$

$$7x \geq 15 - 1 \text{ and } -2x - 7x > -27 - 15$$

$$7x \geq 14 \text{ and } -9x > -42$$

$$x \geq 2 \text{ and } -x > -42/9$$

$$x \geq 2 \text{ and } x < 14/3$$

$$\Rightarrow 2 \leq x < 14/3$$

But as $x \in \mathbb{N}$

The solution set is $\{2, 3, 4\}$.

16. If $x \in \mathbb{Z}$, solve $2 + 4x < 2x - 5 \leq 3x$. Also represent its solution on the number line.

Solution

Given inequation, $2 + 4x < 2x - 5 \leq 3x$

So, we have

$$2 + 4x < 2x - 5 \text{ and } 2x - 5 \leq 3x$$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$4x - 2x < -5 - 2 \text{ and } 2x - 3x \leq 5$$

$$2x < -7 \text{ and } -x \leq 5$$

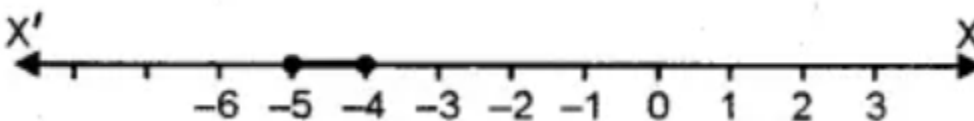
$$x < -7/2 \text{ and } x \geq -5$$

$$\Rightarrow -5 \leq x < -7/2$$

As $x \in \mathbb{Z}$

The solution set is $\{-5, -4\}$.

Representing the solution on a number line:



17. Solve: $(4x - 10)/3 \leq (5x - 7)/2$, $x \in \mathbb{R}$ and represent the solution set on the number line.

Solution:

Given inequation, $(4x - 10)/3 \leq (5x - 7)/2$

$2(4x - 10) \leq 3(5x - 7)$ [On cross-multiplying]

$$8x - 20 \leq 15x - 21$$

$$8x - 15x \leq -21 + 20$$

$$-7x \leq -1$$

$$-x \leq -1/7$$

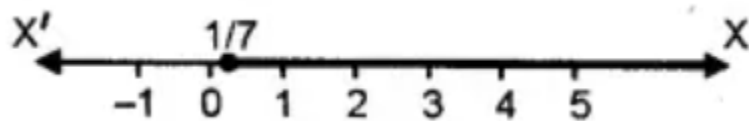
$$x \geq 1/7$$

As $x \in \mathbb{R}$

Hence, the solution set is $\{x: x \in \mathbb{R}, x \geq 1/7\}$

Representing the solution on a number line:

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>



18. Solve $3x/5 - (2x - 1)/3 > 1$, $x \in \mathbb{R}$ and represent the solution set on the number line.

Solution:

Given inequation, $3x/5 - (2x - 1)/3 > 1$

$(9x - 10x + 5)/15 > 1$ [Taking L.C.M]

$$-x + 5 > 15$$

$$-x > 15 - 5$$

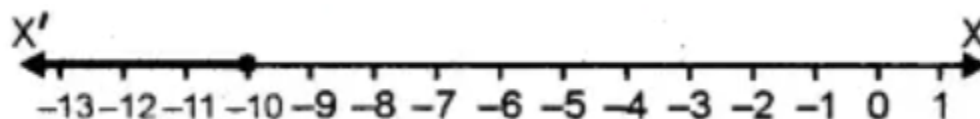
$$-x > 10$$

$$x < -10$$

As $x \in \mathbb{R}$

Hence, the solution set is $\{x: x \in \mathbb{R}, x < -10\}$

Representing the solution on a number line:



19. Given that $x \in \mathbb{R}$, solve the following inequation and graph the solution on the number line: $-1 \leq 3 + 4x < 23$.

Solution:

Given inequation, $-1 \leq 3 + 4x < 23$

$$-1 - 3 \leq 4x < 23 - 3$$

$$-4 \leq 4x < 20$$

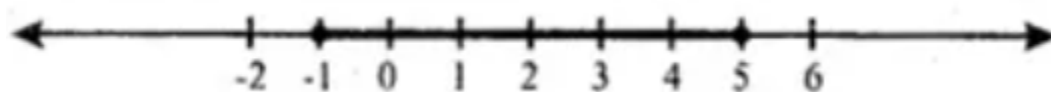
$$-4/4 \leq x < 20/4$$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$-1 \leq x < 5$$

Hence, the solution set is $\{-1 \leq x < 5; x \in \mathbb{R}\}$

Representing the solution on a number line:



20. Solve the following inequation and graph the solution on the number line.

$$, x \in \mathbb{R}$$

Solution:

Given inequation,

$$-2\frac{2}{3} \leq x + \frac{1}{3} < 3 + \frac{1}{3}$$

$$-8/3 \leq (3x + 1)/3 < 10/3$$

$$-8 \leq 3x + 1 < 10 \text{ [Multiplying by 3]}$$

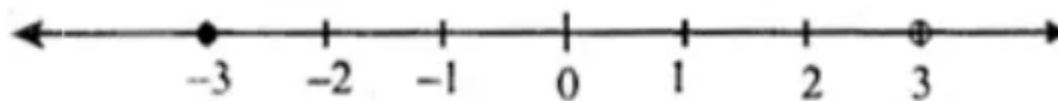
$$-8 - 1 \leq 3x < 10 - 1$$

$$-9 \leq 3x < 9$$

$$-3 \leq x < 3 \text{ [Dividing by 3]}$$

Thus, the solution set is $\{x: x \in \mathbb{R}, -3 \leq x < 3\}$

Representing the solution on a number line:



21. Solve the following inequation and represent the solution set on the number line:

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

Solution:

Given in equation,

$$-3 < -\frac{1}{2} - \frac{2x}{3} \leq \frac{5}{6}, x \in R$$

$$-3 < -(3 + 4x)/6 \leq 5/6 \text{ [Taking L.C.M]}$$

$$-18 < -3 - 4x \leq 5 \text{ [Multiplying by 6]}$$

$$-18 + 3 < -4x \leq 5 + 3$$

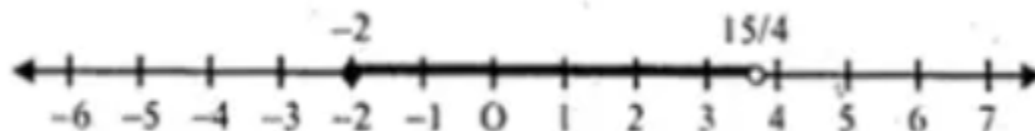
$$-15 < -4x \leq 8$$

$$-15/4 < -x \leq 8/4$$

$$-2 \leq x < 15/4$$

Hence, the solution set is $\{x : x \in R, -2 \leq x < 15/4\}$

Representing the solution on a number line:



22. Solving the following inequation, write the solution set and represent it on the number line

$$-3(x - 7) \geq 15 - 7x >, x \in R$$

Solution:

Given inequation, $-3(x - 7) \geq 15 - 7x >$

$$\frac{x+1}{3}$$

$$-3x + 21 \geq 15 - 7x > (x + 1)/3$$

So,

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$-3x + 21 \geq 15 - 7x$$

$$7x - 3x \geq 15 - 21$$

$$4x \geq -6$$

$$x \geq -6/4$$

$$x \geq -3/2$$

And,

$$15 - 7x > (x + 1)/3$$

$$3(15 - 7x) > x + 1$$

$$45 - 21x > x + 1$$

$$-21x - x > 1 - 45$$

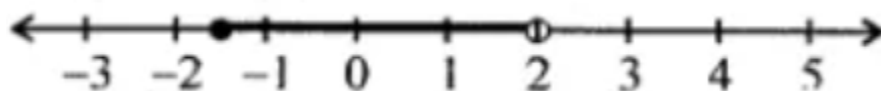
$$-22x > -44$$

$$-x > -44/22$$

$$x < 2$$

Hence, the solution set is $\{x : x \in \mathbb{R}, -3/2 \leq x < 2\}$

Representing the solution on a number line:



23. Solve the following inequation, write down the solution set and represent it on the real number line:

$$-2 + 10x \leq 13x + 10 \leq 24 + 10x, x \in \mathbb{Z}$$

Solution:

Given inequation, $-2 + 10x \leq 13x + 10 \leq 24 + 10x$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

So, we have

$$-2 + 10x \leq 13x + 10 \text{ and } 13x + 10 \leq 24 + 10x$$

$$10x - 13x \leq 10 + 2 \text{ and } 13x - 10x \leq 24 - 10$$

$$-3x \leq 12 \text{ and } 3x \leq 14$$

$$x \geq -12/3 \text{ and } x \leq 14/3$$

$$x \geq -4 \text{ and } x \leq 14/3$$

$$\text{So, } -4 \leq x \leq 14/3$$

$$\text{As } x \in \mathbb{Z}$$

Thus, the solution set is $\{-4, -3, -2, -1, 0, 1, 2, 3, 4\}$

Representing the solution on a number line:



24. Solve the inequation $2x - 5 \leq 5x + 4 < 11$, where $x \in \mathbb{I}$. Also represent the solution set on the number line.

Solution:

$$\text{Given inequation, } 2x - 5 \leq 5x + 4 < 11$$

So, we have

$$2x - 5 \leq 5x + 4 \text{ and } 5x + 4 < 11$$

$$2x - 5x \leq 4 + 5 \text{ and } 5x < 11 - 4$$

$$-3x \leq 9 \text{ and } 5x < 7$$

$$-x \leq 9/3 \text{ and } x < 7/5$$

$$x \geq -3 \text{ and } x < 7/5$$

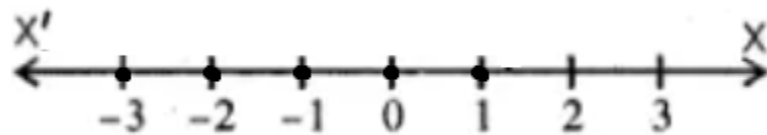
$$-3 \leq x < 7/5$$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

As $x \in I$

Thus, the solutions set is $\{-3, -2, -1, 0, 1\}$

Representing the solution on a number line:



25. If $x \in I$, A is the solution set of $2(x - 1) < 3x - 1$ and B is the solution set of $4x - 3 \leq 8 + x$, find $A \cap B$.

Solution:

Given inequations,

$$2(x - 1) < 3x - 1 \text{ and } 4x - 3 \leq 8 + x \text{ for } x \in I$$

Solving for both, we have

$$2x - 3x < 2 - 1 \text{ and } 4x - x \leq 8 + 3$$

$$-x < 1 \text{ and } 3x \leq 11$$

$$x > -1 \text{ and } x \leq 11/3$$

Hence,

$$\text{Solution set } A = \{0, 1, 2, 3, \dots\}$$

$$\text{Solution set } B = \{3, 2, 1, 0, -1, \dots\}$$

$$\text{Thus, } A \cap B = \{0, 1, 2, 3\}$$

26. If P is the solution set of $-3x + 4 < 2x - 3$, $x \in N$ and Q is the solution set of $4x - 5 < 12$, $x \in W$, find

(i) $P \cap Q$

(ii) $Q - P$.

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

Solution:

Given inequations,

$$-3x + 4 < 2x - 3 \text{ where } x \in \mathbb{N} \text{ and } 4x - 5 < 12 \text{ where } x \in \mathbb{W}$$

So, solving

$$-3x + 4 < 2x - 3 \text{ where } x \in \mathbb{N}$$

$$-3x - 2x < -3 - 4$$

$$-5x < -7$$

$$x > 7/5$$

Hence, the solution set P is $\{2, 3, 4, 5, \dots\}$

And, solving

$$4x - 5 < 12 \text{ where } x \in \mathbb{W}$$

$$4x < 12 + 5$$

$$4x < 17$$

$$x < 17/4$$

Hence, the solution set Q is $\{0, 1, 2, 3, 4\}$

Therefore,

$$(i) P \cap Q = \{2, 3, 4\}$$

$$(ii) Q - P = \{0, 1\}$$

$$27. A = \{x : 11x - 5 > 7x + 3, x \in \mathbb{R}\} \text{ and}$$

$$B = \{x : 18x - 9 \geq 15 + 12x, x \in \mathbb{R}\}$$

Find the range of set $A \cap B$ and represent it on a number line

Solution:

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

Given, $A = \{x : 11x - 5 > 7x + 3, x \in \mathbb{R}\}$ and $B = \{x : 18x - 9 \geq 15 + 12x, x \in \mathbb{R}\}$

Solving for A,

$$11x - 5 > 7x + 3$$

$$11x - 7x > 3 + 5$$

$$4x > 8$$

$$x > 2$$

Hence, $A = \{x : x > 2, x \in \mathbb{R}\}$

Next, solving for B

$$18x - 9 \geq 15 + 12x$$

$$18x - 12x \geq 15 + 9$$

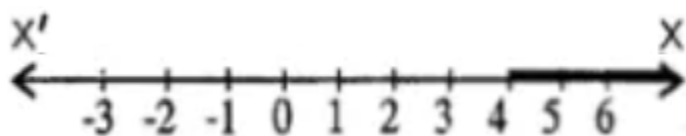
$$6x \geq 24$$

$$x \geq 4$$

Hence, $B = \{x : x \geq 4, x \in \mathbb{R}\}$

Thus, $A \cap B = x \geq 4$

Representing the solution on a number line:



28. Given: $P = \{x : 5 < 2x - 1 \leq 11, x \in \mathbb{R}\}$

$Q = \{x : -1 \leq 3 + 4x < 23, x \in \mathbb{I}\}$ where

$\mathbb{R}$ = (real numbers), $\mathbb{I}$ = (integers)

Represent P and Q on number line. Write down the elements of $P \cap Q$.

Solution:

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

Given, $P \{x : 5 < 2x - 1 \leq 11, x \in \mathbb{R}\}$ and $Q \{x : -1 \leq 3 + 4x < 23, x \in \mathbb{I}\}$

Solving for P,

$$5 < 2x - 1 \leq 11$$

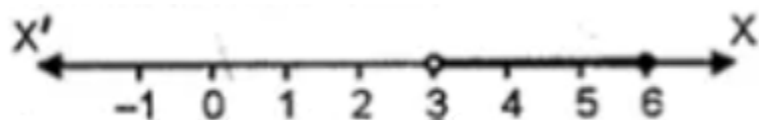
$$5 + 1 < 2x \leq 11 + 1$$

$$6 < 2x \leq 12$$

$$3 < x \leq 6$$

Hence, $P = \{x : 3 < x \leq 6, x \in \mathbb{R}\}$

Representing the solution on a number line:



Next, solving for Q

$$-1 \leq 3 + 4x < 23$$

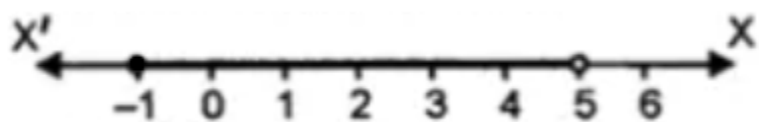
$$-1 - 3 \leq 4x < 23 - 3$$

$$-4 \leq 4x < 20$$

$$-1 \leq x < 5$$

Hence, solution $Q = \{-1, 0, 1, 2, 3, 4\}$

Representing the solution on a number line:



Therefore, $P \cap Q = \{4\}$

29. If $x \in \mathbb{I}$, find the smallest value of x which satisfies the inequation

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

Solution:

Given inequation,

$$(4x + 5)/2 > (5x + 6)/3 \text{ [Taking L.C.M]}$$

$$3(4x + 5) > 2(5x + 6) \text{ [On cross-multiplication]}$$

$$12x + 15 > 10x + 12$$

$$12x - 10x > 12 - 15$$

$$2x > -3$$

$$x > -3/2$$

Hence, for $x \in I$ the smallest value of x is -1 .

30. Given $20 - 5x < 5(x + 8)$, find the smallest value of x , when

(i) $x \in I$

(ii) $x \in W$

(iii) $x \in N$.

Solution:

Given inequation, $20 - 5x < 5(x + 8)$

$$20 - 5x < 5x + 40$$

$$-5x - 5x < 40 - 20$$

$$-10x < 20$$

$$-x < 20/10$$

$$x > -2$$

Thus,

(i) For $x \in I$, the smallest value = -1

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

(ii) For $x \in W$, the smallest value = 0

(iii) For $x \in N$, the smallest value = 1

31. Solve the following inequation and represent the solution set on the number line:

Solution:

Given inequation,

$$4x - 19 < \frac{3x}{5} - 2 \leq -\frac{2}{5} + x, x \in R$$

So, we have

$$4x - 19 < \frac{3x}{5} - 2 \text{ and } \frac{3x}{5} - 2 \leq -\frac{2}{5} + x$$

$$4x - \frac{3x}{5} < 19 - 2 \text{ and } \frac{3x}{5} - x \leq 2 - \frac{2}{5}$$

$$\frac{(20x - 3x)}{5} < 17 \text{ and } \frac{(3x - 5x)}{5} \leq \frac{(10 - 2)}{5}$$

$$17x < 85 \text{ and } -2x \leq 8 \text{ [Multiplying by 5]}$$

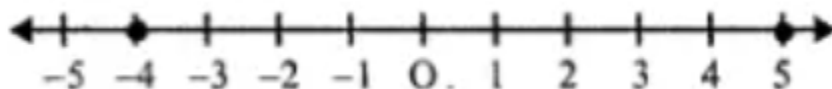
$$x < 5 \text{ and } -x \leq 4$$

$$x < 5 \text{ and } x \geq 4$$

$$-4 \leq x < 5, x \in R$$

Hence, the solution set is $\{x : -4 \leq x < 5, x \in R\}$

Representing the solution on a number line:



32. Solve the given inequation and graph the solution on the number line:

$$2y - 3 < y + 1 \leq 4y + 7;$$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$y \in \mathbb{R}$.

Solution:

Given inequation, $2y - 3 < y + 1 \leq 4y + 7$

So, we have

$$2y - 3 < y + 1 \text{ and } y + 1 \leq 4y + 7$$

$$2y - y < 1 + 3 \text{ and } y - 4y \leq 7 - 1$$

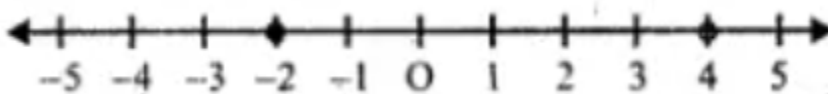
$$y < 4 \text{ and } -3y \leq 6$$

$$y < 4 \text{ and } -y \leq 2 \Rightarrow y \geq -2$$

$$\text{Thus, } -2 \leq y < 4$$

The solution set is $\{y : -2 \leq y < 4, y \in \mathbb{R}\}$

Representing the solution on a number line:



33. Solve the inequation and represent the solution set on the number line.

Solution:

Given inequation,

$$-3 + x \leq \frac{8x}{3} + 2 \leq \frac{14}{3} + 2x, \text{ Where } x \in I$$

So, we have

$$-3 + x \leq \frac{8x}{3} + 2 \text{ and } \frac{8x}{3} + 2 \leq \frac{14}{3} + 2x$$

$$x - \frac{8x}{3} \leq 2 + 3 \text{ and } \frac{8x}{3} - 2x \leq \frac{14}{3} - 2$$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$(3x - 8x)/3 \leq 5 \text{ and } (8x - 6x)/3 \leq (14 - 6)/3 \text{ [Taking L.C.M]}$$

$$-5x/3 \leq 5 \text{ and } 2x \leq 8$$

$$-5x \leq 15 \text{ and } x \leq 8/2$$

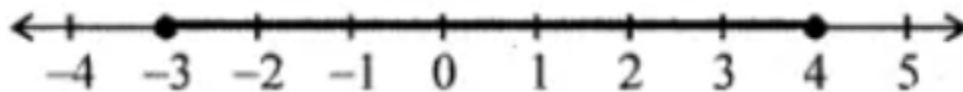
$$-x \leq 3 \text{ and } x \leq 4$$

$$x \geq -3 \text{ and } x \leq 4$$

$$\Rightarrow -3 \leq x \leq 4$$

Thus, the solution set is $\{-3, -2, -1, 0, 1, 2, 3, 4\}$

Representing the solution on a number line:



34. Find the greatest integer which is such that if 7 is added to its double, the resulting number becomes greater than three times the integer.

Solution:

Let's consider the greatest integer to be x

Then according to the given condition, we have

$$2x + 7 > 3x$$

$$2x - 3x > -7$$

$$-x > -7$$

$$x < 7, x \in \mathbb{R}$$

Hence, the greatest integer value is 6.

35. One-third of a bamboo pole is buried in mud, one-sixth of it is in water and the part above the water is greater than or equal to 3 metres. Find the length of the shortest pole.

Solution:

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

Let's assume the length of the shortest pole = x metre

Now,

Length of the pole which is buried in mud = $x/3$

Length of the pole which is in the water = $x/6$

Then according to the given condition, we have

$$x - [x/3 + x/6] \geq 3$$

$$x - [(2x + x)/6] \geq 3$$

$$x - 3x/6 \geq 3$$

$$x - x/2 \geq 3$$

$$x/2 \geq 3$$

$$x \geq 6 \text{ [Multiplying by 6]}$$

Therefore, the length of the shortest pole is 6 metres.

Chapter Test

1. Solve the inequation: $5x - 2 \leq 3(3 - x)$ where $x \in \{-2, -1, 0, 1, 2, 3, 4\}$. Also represent its solution on the number line.

Solution:

Given inequation, $5x - 2 \leq 3(3 - x)$

$$5x - 2 \leq 9 - 3x$$

$$5x + 3x \leq 9 + 2$$

$$8x \leq 11$$

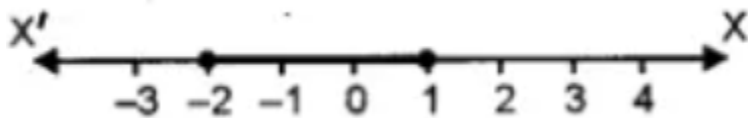
$$x \leq 11/8$$

As $x \in \{-2, -1, 0, 1, 2, 3, 4\}$

The solution set is $\{-2, -1, 0, 1\}$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

Representing the solution on a number line:



2. Solve the inequation: $6x - 5 < 3x + 4$, $x \in I$

Solution:

Given inequation, $6x - 5 < 3x + 4$

$$6x - 3x < 4 + 5$$

$$3x < 9$$

$$x < 9/3$$

$$x < 3$$

As $x \in I$

The solution set is $\{2, 1, 0, -1, -2, \dots\}$

3. Find the solution set of the inequation $x + 5 \leq 2x + 3$; $x \in R$

Graph the solution set on the number line.

Solution:

Given inequation, $x + 5 \leq 2x + 3$

$$x - 2x \leq 3 - 5$$

$$-x \leq -2$$

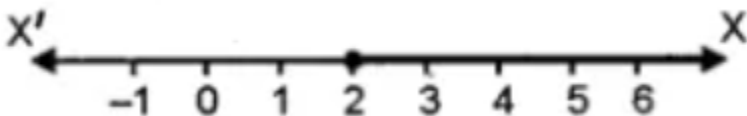
$$x \geq 2$$

As $x \in R$

Thus, the solution set is $\{2, 3, 4, 5, \dots\}$

Representing the solution on a number line:

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>



4. If $x \in \mathbb{R}$ (real numbers) and $-1 < 3 - 2x \leq 7$, find solution set and present it on a number line.

Solution:

Given inequation, $-1 < 3 - 2x \leq 7$

$$-1 - 3 < -2x \leq 7 - 3$$

$$-4 < -2x \leq 4$$

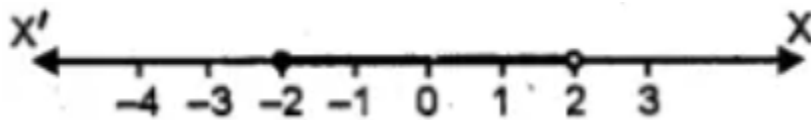
$$-4/2 < -x \leq 4/2$$

$$-2 < -x \leq 2$$

Thus, $-2 \leq x < 2$

The solution set is $\{x : x \in \mathbb{R}, -2 \leq x < 2\}$

Representing the solution on a number line:



5. Solve the inequation:

$$\frac{5x+1}{7} - 4 \left(\frac{x}{7} + \frac{2}{5} \right) \leq 1\frac{3}{5} + \frac{3x-1}{7}, x \in \mathbb{R}$$

Solution:

Given inequation,

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$\frac{5x+1}{7} - 4\left(\frac{x}{7} + \frac{2}{5}\right) \leq 1\frac{3}{5} + \frac{3x-1}{7}, x \in R$$

$$(5x + 1)/7 - 4(5x + 14)/35 \leq 8/5 + (3x - 1)/7 [5(5x + 1) - 4(5x + 14)]/35 \leq [56 + 5(3x - 1)]/35$$

[Taking L.C.M]

$$(25x + 5 - 20x - 56) \leq 56 + 15x - 5$$

$$5x - 51 \leq 51 + 15x$$

$$5x - 15x \leq 51 + 51$$

$$-10x \leq 102$$

$$-x \leq 102/10$$

$$x \geq -51/5$$

Hence, the solution set is $\{x : x \in R, x \geq -51/5\}$

6. Find the range of values of a, which satisfy $7 \leq -4x + 2 < 12$, $x \in R$. Graph these values of a on the real number line.

Solution:

$$7 < -4x + 2 < 12$$

$$7 < -4x + 2 \text{ and } -4x + 2 < 12$$

7. If $x \in R$, solve $2x - 3 \geq x + (1 - x)/3 > 2x/5$

Solution:

Given inequation, $2x - 3 \geq x + (1 - x)/3 > 2x/5$

So, we have

$$2x - 3 \geq x + (1 - x)/3 \text{ and } x + (1 - x)/3 > 2x/5$$

$$2x - 3 \geq (3x + 1 - x)/3 \text{ and } (3x + 1 - x)/3 > 2x/5 \text{ [On taking L.C.M]}$$

$$3(2x - 3) \geq 2x + 1 \text{ and } (2x + 1) \times 5 > 2x \times 3 \text{ [Upon cross multiplication]}$$

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$6x - 9 \geq 2x + 1 \text{ and } 10x + 5 > 6x$$

$$6x - 2x \geq 1 + 9 \text{ and } 10x - 6x > -5$$

$$4x \geq 10 \text{ and } 4x > -5$$

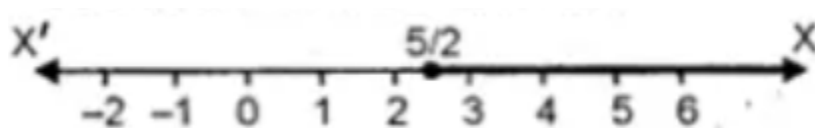
$$x \geq 10/4 \text{ and } x > -5/4$$

$$x \geq 5/2$$

As $x \in \mathbb{R}$

Thus, the solution set is $\{x: x \in \mathbb{R}, x \geq 5/2\}$

Representing the solution on a number line:



7. If $x \in \mathbb{R}$, solve $2x - 3 \geq x + (1 - x)/3 > 2x/5$. Also represent the solution on the number line.

Solution:

Given inequation, $2x - 3 \geq x + (1 - x)/3 > 2x/5$

So, we have

$$2x - 3 \geq x + (1 - x)/3 \text{ and } x + (1 - x)/3 > 2x/5$$

$$2x - 3 \geq (3x + 1 - x)/3 \text{ and } (3x + 1 - x)/3 > 2x/5 \text{ [On taking L.C.M]}$$

$$3(2x - 3) \geq 2x + 1 \text{ and } 5 \times (2x + 1) > 3 \times 2x$$

$$6x - 9 \geq 2x + 1 \text{ and } 10x + 5 > 6x$$

$$6x - 2x \geq 1 + 9 \text{ and } 10x - 6x > -5$$

$$4x \geq 10 \text{ and } 4x > -5$$

$$x \geq 10/4 \text{ and } x > -5/4$$

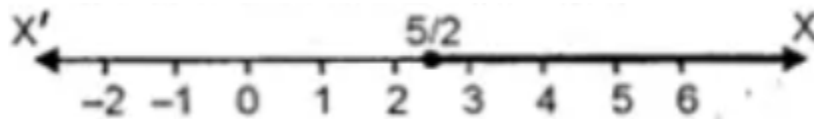
<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$x \geq 5/2$$

As $x \in \mathbb{R}$

The solution set = $\{x: x \in \mathbb{R}, x \geq 5/2\}$

Representing the solution on a number line:



8. Find positive integers which are such that if 6 is subtracted from five times the integer then the resulting number cannot be greater than four times the integer.

Solution:

Let's consider the positive integer be x

Then according to the problem, we have

$$5x - 6 < 4x$$

$$5x - 4x < 6$$

$$\Rightarrow x < 6$$

Hence, the solution set = $\{x : x < 6\}$

$$= \{1, 2, 3, 4, 5, 6\}$$

9. Find three smallest consecutive natural numbers such that the difference between one-third of the largest and one-fifth of the smallest is at least 3.

Solution:

Let's consider the first least natural number as x

Then, second number = $x + 1$

And third number = $x + 2$

So, according the conditions given in the problem, we have

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

$$\frac{1}{3} \times (x + 2) - \frac{x}{5} \geq 3$$

$$5x + 10 - 3x \geq 3 \times 15 \text{ [Multiplying by 15 the L.C.M of 3 and 5]}$$

$$2x \geq 45 - 10$$

$$2x \geq 35$$

$$x \geq 35/2$$

$$x \geq 17.5$$

As x is a natural least number

Thus, first least natural number = 18

Second number = $18 + 1 = 19$

And, third number = $18 + 2 = 20$

Hence, the least natural numbers are 18, 19 and 20



<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

ML Aggarwal Solutions Class 10 Maths

- Chapter 1- Goods and Service Tax (GST)
- Chapter 2- Banking
- Chapter 3- Shares and Dividends
- Chapter 4- Linear Inequations
- Chapter 5- Quadratic Equations in One Variable
- Chapter 6- Factorization
- Chapter 7- Ratio and Proportion
- Chapter 8- Matrices
- Chapter 9- Arithmetic and Geometric Progression
- Chapter 10- Reflection
- Chapter 11- Section Formula
- Chapter 12- Equation of Straight Line
- Chapter 13- Similarity
- Chapter 14- Locus
- Chapter 15- Circles
- Chapter 16- Constructions
- Chapter 17- Mensuration
- Chapter 18- Trigonometric Identities
- Chapter 19- Trigonometric Tables
- Chapter 20- Heights and Distances
- Chapter 21- Measures Of Central Tendency
- Chapter 22- Probability

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

About ML Aggarwal

M. L. Aggarwal, is an Indian mechanical engineer, educator. His achievements include research in solutions of industrial problems related to fatigue design. Recipient Best Paper award, Manipal Institute of Technology, 2004. Member of TSTE.

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>

About IndCareer

IndCareer.com is a leading developer of online career guidance resources for the Indian marketplace. Established in 2007, IndCareer.com is currently used by over thousands of institutions across India, including schools, employment agencies, libraries, colleges and universities.

IndCareer.com is designed to assist you in making the right career decision - a decision that meets your unique interests and personality.

For any clarifications or questions you can write to **info@indcareer.com**

Postal Address

IndCareer.com
52, Shilpa Nagar,
Somalwada
Nagpur - 440015
Maharashtra, India

WhatsApp: +91 9561 204 888

Website: <https://www.indcareer.com>

<https://www.indcareer.com/schools/ml-aggarwal-solutions-for-class-10-maths-chapter-4-linear-in-equations/>