



Mathematics-9  
Unit 7 – Exercise 7.1

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**Exercise 7.1**

**Q.1** Solve the following equations

(i)  $\frac{2}{3}x - \frac{1}{2}x = x + \frac{1}{6}$  (LHR 2013)

**Solution:**

$$\frac{2}{3}x - \frac{1}{2}x = x + \frac{1}{6}$$

$$\frac{4x - 3x}{6} = \frac{6x + 1}{6}$$

$$x = 6 \frac{(6x + 1)}{6}$$

$$x = 6x + 1$$

$$-6x + x = 1$$

$$-5x = 1$$

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

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

**Check**

Substitution  $x = -\frac{1}{5}$

$$\frac{2}{3} \times \frac{-1}{5} - \frac{1}{2} \times \frac{-1}{5} = \frac{-1}{5} + \frac{1}{6}$$

$$\frac{-2}{15} + \frac{1}{10} = \frac{-6 + 5}{30}$$

$$\frac{-2 \times 2 + 1 \times 3}{30} = \frac{-1}{30}$$

$$\frac{-4 + 3}{30} = \frac{-1}{30}$$

$$\frac{-1}{30} = \frac{-1}{30}$$

**Solution Set** =  $\left\{ -\frac{1}{5} \right\}$

(ii)  $\frac{x-3}{3} - \frac{x-2}{2} = -1$

(FSD 2017, RWP 2016, D.G.K 2016)

**Solution**

$$\frac{x-3}{3} - \frac{x-2}{2} = -1$$

By taking L.C.M

$$\frac{2(x-3) - 3(x-2)}{6} = -1$$

$$2x - 6 - 3x + 6 = -6$$

$$-x = -6$$

$$\Rightarrow x = 6$$

**Check**

$$\frac{x-3}{3} - \frac{x-2}{2} = -1$$

When  $x = 6$

$$\frac{6-3}{3} - \frac{6-2}{2} = -1$$

$$\frac{3}{3} - \frac{4}{2} = -1$$

$$\frac{6-12}{6} = -1$$

$$\frac{-6}{6} = -1$$

$$-1 = -1$$

**Solution Set** =  $\{6\}$

(iii)  $\frac{1}{2} \left( x - \frac{1}{6} \right) + \frac{2}{3} = \frac{5}{6} + \frac{1}{3} \left( \frac{1}{2} - 3x \right)$

**Solution:**

$$\frac{1}{2} \left( x - \frac{1}{6} \right) + \frac{2}{3} = \frac{5}{6} + \frac{1}{3} \left( \frac{1}{2} - 3x \right)$$

Taking L.C.M of brackets

$$\frac{1}{2} \left( \frac{6x-1}{6} \right) + \frac{2}{3} = \frac{5}{6} + \frac{1}{3} \left( \frac{1-6x}{2} \right)$$

## Unit - 7

## Linear Equations and Inequalities

$$\frac{6x-1}{12} + \frac{2}{3} = \frac{5}{6} + \frac{1-6x}{6}$$

$$\frac{6x-1+8}{12} = \frac{5+1-6x}{6}$$

$$\cancel{12}(6x+7) = 6-6x$$

$$\frac{6x+7}{2} = 6-6x$$

$$6x+7=2(6-6x)$$

$$6x+7=12-12x$$

$$6x+12x=12-7$$

$$18x=5$$

$$x = \frac{5}{18}$$

**Check**

**(A.B)**

$$\frac{1}{2}\left(x - \frac{1}{6}\right) + \frac{2}{3} = \frac{5}{6} + \frac{1}{3}\left(\frac{1}{2} - 3x\right)$$

$$\text{When } x = \frac{5}{18}$$

$$\frac{1}{2}\left[\frac{15}{18} - \frac{1}{6}\right] + \frac{2}{3} = \frac{5}{6} + \frac{1}{3}\left[\frac{1}{2} - 3\left(\frac{5}{18}\right)\right]$$

$$\frac{1}{2}\left[\frac{5-3}{18}\right] + \frac{2}{3} = \frac{5}{6} + \frac{1}{3}\left[\frac{1}{2} - \frac{5}{6}\right]$$

$$\frac{1}{2}\left[\frac{\cancel{2}}{18}\right] + \frac{2}{3} = \frac{5}{6} + \frac{1}{3}\left[\frac{3-5}{6}\right]$$

$$\frac{1}{\cancel{2}}\left[\frac{\cancel{2}}{18}\right] + \frac{2}{3} = \frac{5}{6} + \frac{1}{3}\left[\frac{-\cancel{2}^1}{\cancel{6}^3}\right]$$

$$\frac{1}{18} + \frac{2}{3} = \frac{5}{6} + \frac{1}{3}\left[\frac{-1}{3}\right]$$

$$\frac{1+12}{18} = \frac{5}{6} - \frac{1}{9}$$

$$\frac{13}{18} = \frac{15-2}{18}$$

$$\frac{13}{18} = \frac{13}{18}$$

$$\text{Solution Set} = \left\{\frac{5}{18}\right\}$$

$$\text{(iv)} \quad x + \frac{1}{3} = 2\left[x - \frac{2}{3}\right] - 6x$$

**Solution:**

$$x + \frac{1}{3} = 2\left[x - \frac{2}{3}\right] - 6x$$

$$\frac{3x+1}{3} = 2\left[\frac{3x-2}{3}\right] - 6x$$

$$\frac{3x+1}{3} = \frac{6x-4}{3} - 6x$$

Taking L.C.M of right side

$$\frac{3x+1}{3} = \frac{6x-4-18x}{3}$$

$$\frac{3x+1}{\cancel{3}} = \frac{(-12x-4)}{\cancel{3}}$$

$$3x+1 = -12x-4$$

$$3x+12x = -4-1$$

$$15x = -5$$

$$x = \frac{-5}{15}$$

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

**Check**

**(A.B)**

$$x + \frac{1}{3} = 2\left[x - \frac{2}{3}\right] - 6x$$

$$\text{When } x = \frac{-1}{3}$$

$$\frac{-\cancel{1}}{\cancel{3}} + \frac{1}{\cancel{3}} = 2\left[\frac{-1}{3} - \frac{2}{3}\right] - 6\left(\frac{-1}{3}\right)$$

$$0 = 2\left[\frac{-1-2}{3}\right] + \frac{\cancel{6}^2}{\cancel{3}}$$

$$0 = 2\left[\frac{-\cancel{3}}{\cancel{3}}\right] + 2$$

$$0 = 2(-1) + 2$$

$$0 = -2 + 2$$

$$0 = 0$$

$$\text{Solution Set} = \left\{\frac{-1}{3}\right\}$$

## Unit - 7

## Linear Equations and Inequalities

(v)  $\frac{5(x-3)}{6} - x = 1 - \frac{x}{9}$

**Solution**

$$\frac{5(x-3)}{6} - x = 1 - \frac{x}{9}$$

$$\frac{5x-15-6x}{6} = \frac{9-x}{9}$$

$$\frac{-15-x}{6} = \frac{9-x}{9}$$

$$9(-15-x) = 6(9-x)$$

$$-135-9x = 54-6x$$

$$-135-54 = -6x+9x$$

$$-189 = 3x$$

$$\frac{-189}{3} = x$$

$$x = -63$$

**Check**

$$\frac{5(x-3)}{6} - x = 1 - \frac{x}{9}$$

When  $x = -63$

$$\frac{5(-63-3)}{6} - (-63) = 1 - \frac{(-63)}{9}$$

$$\frac{5(-66)}{6} + 63 = 1 + 7$$

$$-55 + 63 = 8$$

$$8 = 8$$

$$\text{Solution Set} = \{-63\}$$

(vi)  $\frac{x}{3x-6} = 2 - \frac{2x}{x-2}, x \neq 2$  (A.B)

**Solution:**

$$\frac{x}{3x-6} = 2 - \frac{2x}{x-2}, x \neq 2$$

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

$$\frac{x}{3(x-2)} = \frac{2x-4-2x}{x-2}$$

$$\frac{x}{3(x-2)} = \frac{-4}{x-2}$$

$$x(x-2) = -4 \times 3(x-2)$$

$$x(x-2) = -12(x-2)$$

$$x(x-2) + 12(x-2) = 0$$

$$(x-2)(x+12) = 0$$

$$x-2 = 0, \text{ or } x+12 = 0$$

$$x = 2, \text{ or } x = -12$$

$$x = 2 \text{ (Rejected because } x \neq 2 \text{)}$$

$$\text{Hence } x = -12$$

**Check**

$$\frac{x}{3x-6} = 2 - \frac{2x}{x-2}$$

When  $x = -12$

$$\frac{-12}{3(-12)-6} = 2 - \frac{2(-12)}{-12-2}$$

$$\frac{-12}{-36-6} = 2 + \frac{24}{-14}$$

$$\frac{-12}{-42} = 2 - \frac{24}{14}$$

$$\frac{12}{42} = 2 - \frac{12}{7}$$

$$\frac{2}{7} = \frac{14-12}{7}$$

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

$$\text{Solution Set} = \{-12\}$$

(vii)  $\frac{2x}{2x+5} = \frac{2}{3} - \frac{5}{4x+10}$  (A.B)

**Solution**

$$\frac{2x}{2x+5} = \frac{2}{3} - \frac{5}{4x+10}$$

$$\frac{2x}{2x+5} = \frac{2(4x+10) - 3 \times 5}{3(4x+10)}$$

$$\frac{2x \times 3(4x+10)}{2x+5} = 8x + 20 - 15$$

$$\frac{6x \times 2(2x+5)}{(2x+5)} = 8x + 5$$

$$12x = 8x + 5$$

$$12x - 8x = 5$$

$$4x = 5$$

$$x = \frac{5}{4}$$

## Unit - 7

## Linear Equations and Inequalities

### Check

$$\frac{2x}{2x+5} = \frac{2}{3} - \frac{5}{4x+10}$$

When  $x = \frac{5}{4}$

$$\frac{2\left(\frac{5}{4}\right)}{2\left(\frac{5}{4}\right)+5} = \frac{2}{3} - \frac{5}{4\left(\frac{5}{4}\right)+10}$$

$$\frac{\frac{5}{2}}{\frac{5}{2}+5} = \frac{2}{3} - \frac{5}{5+10}$$

$$\frac{\frac{5}{2}}{5+10} = \frac{2}{3} - \frac{5}{15}$$

$$\frac{\frac{5}{2}}{15} = \frac{2}{3} - \frac{1}{3}$$

$$\frac{\cancel{5}}{\cancel{2}} \times \frac{\cancel{2}}{\cancel{15}^3} = \frac{2-1}{3}$$

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

**Solution Set** =  $\left\{\frac{5}{4}\right\}$

(viii)  $\frac{2x}{x-1} + \frac{1}{3} = \frac{5}{6} + \frac{2}{x-1} \quad x \neq 1 \text{ (A.B)}$

**Solution:**

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

$$\frac{3 \times 2x + 1(x-1)}{3(x-1)} = \frac{5(x-1) + 2 \times 6}{6(x-1)}$$

$$\frac{6x+x-1}{3(x-1)} = \frac{5x-5+12}{6(x-1)}$$

$$\frac{7x-1}{3(x-1)} = \frac{5x-5+12}{6(x-1)}$$

$$7x-1 = \frac{5x+7}{2}$$

$$2(7x-1) = 5x+7$$

$$14x-2 = 5x+7$$

$$14x-5x = 7+2$$

$$9x = 9$$

$$x = \frac{9}{9}$$

$$x = 1$$

No solution because  $x \neq 1$ .

(ix)  $\frac{2}{x^2-1} - \frac{1}{x+1} = \frac{1}{x+1} \quad x \neq \pm 1 \text{ (A.B)}$

**Solution**

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

$$\frac{2}{(x-1)(x+1)} - \frac{1}{x+1} = \frac{1}{x+1}$$

$$\frac{2-(x-1)}{(x-1)(x+1)} = \frac{1}{x+1}$$

$$\frac{2-(x-1)}{(x-1)(x+1)} = \frac{1}{x+1}$$

$$2-x+1 = \frac{(x-1)(x+1)}{(x+1)}$$

$$3-x = x-1$$

$$1+3 = x+x$$

$$4 = 2x$$

$$\frac{4}{2} = x$$

$$x = 2$$

**Check**

$$\frac{2}{2^2-1} - \frac{1}{2+1} = \frac{1}{2+1}$$

$$\frac{2}{4-1} - \frac{1}{3} = \frac{1}{3}$$

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

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

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

**Solution Set** =  $\{2\}$

## Unit - 7

## Linear Equations and Inequalities

$$(x) \quad \frac{2}{3x+6} = \frac{1}{6} - \frac{1}{2x+4} \quad (\text{A.B})$$

**Solution:**

$$\begin{aligned} \frac{2}{3x+6} &= \frac{1}{6} - \frac{1}{2x+4} \\ \frac{2}{3(x+2)} &= \frac{1}{6} - \frac{1}{2(x+2)} \\ \frac{2}{3(x+2)} &= \frac{x+2-3}{6(x+2)} \\ \frac{2 \times 6(x+2)}{3(x+2)} &= x-1 \end{aligned}$$

$$4 = x-1$$

$$4+1 = x$$

$$x = 5$$

**Check**

$$\begin{aligned} \frac{2}{3(5)+6} &= \frac{1}{6} - \frac{1}{2(5)+4} \\ \frac{2}{15+6} &= \frac{1}{6} - \frac{1}{10+4} \\ \frac{2}{21} &= \frac{1}{6} - \frac{1}{14} \\ \frac{2}{21} &= \frac{7-3}{42} \\ \frac{2}{21} &= \frac{4^2}{42^{21}} \\ \frac{2}{21} &= \frac{2}{21} \end{aligned}$$

$$\text{Solution Set} = \{5\}$$

**Q.2** Check each equation and check for extraneous solution, if any

$$(i) \quad \sqrt{3x+4} = 2$$

(LHR 2013, GRW 2016, SWL 2014, 16, BWP 2016, D.G.K 2017)

**Solution:**

$$\sqrt{3x+4} = 2$$

Taking square on both side

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

$$3x+4=4$$

$$3x=4-4$$

$$3x=0$$

$$x = \frac{0}{3}$$

$$x=0$$

**Check**

$$\sqrt{3x+4} = 2$$

When  $x=0$

$$\sqrt{3(0)+4} = 2$$

$$\sqrt{4} = 2$$

$$2 = 2$$

L.H.S = R.H.S

$$\text{Solution Set} = \{0\}$$

$$(ii) \quad \sqrt[3]{2x-4} - 2 = 0 \quad (\text{A.B})$$

(LHR 2015, BWP 2017)

**Solution:**

$$\sqrt[3]{2x-4} - 2 = 0$$

$$\sqrt[3]{2x-4} = 2$$

Taking cube on both sides

$$(\sqrt[3]{2x-4})^3 = (2)^3$$

$$2x-4=8$$

$$2x=8+4$$

$$2x=12$$

$$x = \frac{12}{2}$$

$$x = 6$$

**Check**

$$\sqrt[3]{2x-4} - 2 = 0$$

When  $x=6$

$$\sqrt[3]{2x-4} - 2 = 0$$

$$\sqrt[3]{2(6)-4} - 2 = 0$$

$$\sqrt[3]{12-4} - 2 = 0$$

$$\sqrt[3]{8} - 2 = 0$$

$$\sqrt[3]{2^3} - 2 = 0$$

$$2 - 2 = 0$$

$$0 = 0$$

L.H.S = R.H.S

$$\text{Solution Set} = \{6\}$$

## Unit - 7

## Linear Equations and Inequalities

(iii)  $\sqrt{x-3}-7=0$  (A.B)  
(LHR 2014, 17, FSD 2014, BWP 2013, 15, D.G.K 2014)

**Solution:**

$$\sqrt{x-3}-7=0$$

$$\sqrt{x-3}=7$$

Taking square on both side

$$(\sqrt{x-3})^2 = (7)^2$$

$$x-3=49$$

$$x=49+3$$

$$x=52$$

**Check**

$$\sqrt{x-3}-7=0$$

When  $x=52$

$$\sqrt{52-3}-7=0$$

$$\sqrt{49}-7=0$$

$$7-7=0$$

$$0=0$$

L.H.S = R.H.S

$$\text{Solution Set} = \{52\}$$

(iv)  $2\sqrt{t+4}=5$  (A.B)  
(LHR 2015, MTN 2014, D.G.K 2017)

**Solution:**

$$2\sqrt{t+4}=5$$

Taking square on both side

$$(2\sqrt{t+4})^2 = (5)^2$$

$$4(t+4)=25$$

$$t+4 = \frac{25}{4}$$

$$t = \frac{25}{4} - 4$$

$$t = \frac{25-16}{4}$$

$$t = \frac{9}{4}$$

**Check**

$$2\sqrt{t+4}=5$$

When  $t = \frac{9}{4}$

$$2\sqrt{\frac{9}{4}+4}=5$$

$$2\sqrt{\frac{9+16}{4}}=5$$

$$2\sqrt{\frac{25}{4}}=5$$

$$2 \times \frac{5}{2} = 5$$

$$5=5$$

L.H.S = R.H.S

$$\text{Solution Set} = \left\{ \frac{9}{4} \right\}$$

(v)  $\sqrt[3]{2x+3} = \sqrt[3]{x-2}$  (A.B)  
(SWL 2015, SGD 2017)

**Solution:**

$$\sqrt[3]{2x+3} = \sqrt[3]{x-2}$$

Taking cube on both sides

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

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

$$2x-x = -2-3$$

$$x = -5$$

**Check**

$$\sqrt[3]{2x+3} = \sqrt[3]{x-2}$$

When  $x = -5$

$$\sqrt[3]{2(-5)+3} = \sqrt[3]{-5-2}$$

$$\sqrt[3]{-10+3} = \sqrt[3]{-7}$$

$$\sqrt[3]{-7} = \sqrt[3]{-7}$$

L.H.S = R.H.S

$$\text{Solution Set} = \{-5\}$$

(vi)  $\sqrt[3]{2-t} = \sqrt[3]{2t-28}$  (A.B)

**Solution:**

$$\sqrt[3]{2-t} = \sqrt[3]{2t-28}$$

Taking cube on both sides

$$(\sqrt[3]{2-t})^3 = (\sqrt[3]{2t-28})^3$$

$$2-t = 2t-28$$

$$2+28 = 2t+t$$

$$30 = 3t$$

$$\frac{30}{3} = t$$

$$t = 10$$

## Unit - 7

## Linear Equations and Inequalities

### Check

$$\sqrt[3]{2-t} = \sqrt[3]{2t-28}$$

When  $t=10$

$$\sqrt[3]{2-10} = \sqrt[3]{2(10)-28}$$

$$\sqrt[3]{-8} = \sqrt[3]{20-28}$$

$$\sqrt[3]{-8} = \sqrt[3]{-8}$$

L.H.S = R.H.S

**Solution Set** = {10}

(vii)  $\sqrt{2t+6} - \sqrt{2t-5} = 0$  **(A.B)**

**Solution:**

$$\sqrt{2t+6} - \sqrt{2t-5} = 0$$

$$\sqrt{2t+6} = \sqrt{2t-5}$$

Taking square on both side

$$(\sqrt{2t+6})^2 = (\sqrt{2t-5})^2$$

$$2t+6 = 2t-5$$

$$2t-2t = -5-6$$

$$0 = -11$$

Solution is not possible

**Solution Set** = { } or  $\phi$

(viii)  $\sqrt{\frac{x+1}{2x+5}} = 2$   $x \neq \frac{-5}{2}$  **(A.B)**  
(SGD 2016, MTN 2013)

**Solution:**

$$\sqrt{\frac{x+1}{2x+5}} = 2$$

Taking square on both side

$$\left(\sqrt{\frac{x+1}{2x+5}}\right)^2 = (2)^2$$

$$\frac{x+1}{2x+5} = 4$$

$$x+1 = 4(2x+5)$$

$$x+1 = 8x+20$$

$$1-20 = 8x-x$$

$$-19 = 7x$$

$$-\frac{19}{7} = x$$

Or,  $x = \frac{-19}{7}$

### Check

$$\sqrt{\frac{x+1}{2x+5}} = 2$$

When  $x = \frac{-19}{7}$

$$\sqrt{\left(\frac{-19}{7}+1\right) \div \left[2 \times \frac{-19}{7}+5\right]} = 2$$

$$\sqrt{\frac{-19+7}{7} \div \left[\frac{-38}{7}+5\right]} = 2$$

$$\sqrt{\frac{-12}{7} \div \left[\frac{-38+35}{7}\right]} = 2$$

$$\sqrt{\frac{-12}{7} \div \frac{-3}{7}} = 2$$

$$\sqrt{\frac{-12^4}{7} \times \frac{7}{-3}} = 2$$

$$\sqrt{4} = 2$$

$$2 = 2$$

L.H.S = R.H.S

**Solution Set** =  $\left\{\frac{-19}{7}\right\}$

**Unit - 7**

**Linear Equations and Inequalities**



**Mathematics-9**

**Unit 7 – Exercise 7.2**

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- (i)  $|x| = 0$  has only one solution True
- (ii) All absolute value equations have two solutions False
- (iii) The equation  $|x| = 2$  is equivalent to  $x = 2$  or  $x = -2$  True
- (iv) The equation  $|x - 4| = -4$  has no solution True
- (v) The equation  $|2x - 3| = 5$  is equivalent to  $2x - 3 = 5$  or  $2x + 3 = 5$  False

**Q.1**

- (i) **Solve:**  $|3x - 5| = 4$  **(K.B)**  
 (LHR 2014, 17, GRW 2014, 17, FSD 2017, SWL 2016, 17, MTN 2014, 15)

**Solution:**

$$|3x - 5| = 4$$

$$3x - 5 = \pm 4$$

$$3x - 5 = 4 \quad \text{or} \quad 3x - 5 = -4$$

$$3x = 4 + 5 \quad \quad \quad 3x = -4 + 5$$

$$3x = 9 \quad \quad \quad 3x = 1$$

$$x = \frac{9}{3} \quad \quad \quad x = \frac{1}{3}$$

$$x = 3$$

**Check**

Put  $x = 3$  Put  $x = \frac{1}{3}$

$$|3(3) - 5| = 4 \quad \quad \quad \left| 3 \times \frac{1}{3} - 5 \right| = 4$$

$$|9 - 5| = 4 \quad \quad \quad |1 - 5| = 4$$

$$4 = 4 \text{ True} \quad \quad \quad |-4| = 4$$

$$4 = 4 \text{ True}$$

**Solution Set** =  $\left\{ 3, \frac{1}{3} \right\}$

- (ii)  $\frac{1}{2}|3x + 2| - 4 = 11$  **(K.B)**  
 (LHR 2017, SWL 2015, 16, FSD 2016, MTN 2013, 16, RWP 2016)  
**Solution:**

$$\frac{1}{2}|3x + 2| - 4 = 11$$

$$\frac{1}{2}|3x + 2| = 11 + 4$$

$$\frac{1}{2}|3x + 2| = 15$$

$$|3x + 2| = 2 \times 15$$

$$|3x + 2| = 30$$

$$3x + 2 = \pm 30$$

$$3x + 2 = 30 \quad \quad \quad 3x + 2 = -30$$

$$3x = 30 - 2 \quad \quad \quad 3x = -30 - 2$$

$$3x = 28 \quad \quad \quad 3x = -32$$

$$x = \frac{28}{3} \quad \quad \quad x = \frac{-32}{3}$$

**Check**

$$\frac{1}{2}|3x + 2| - 4 = 11 \quad \quad \quad \frac{1}{2}\left| 3 \times \frac{-32}{3} + 2 \right| - 4 = 11$$

$$\frac{1}{2}\left| 3 \times \frac{28}{3} + 2 \right| - 4 = 11 \quad \quad \quad \frac{1}{2}|-32 + 2| - 4 = 11$$

$$\frac{1}{2}|28 + 2| - 4 = 11 \quad \quad \quad \frac{1}{2}|-30| - 4 = 11$$

$$\frac{1}{2} \times 30 - 4 = 11 \quad \quad \quad \frac{1}{2}(30) - 4 = 11$$

$$15 - 4 = 11 \quad \quad \quad 15 - 4 = 11$$

$$11 = 11 \quad \quad \quad 11 = 11$$

**Solution Set** =  $\left\{ \frac{28}{3}, \frac{-32}{3} \right\}$

- (iii)  $|2x + 5| = 11$  **(K.B)**



## Unit - 7

## Linear Equations and Inequalities

(LHR 2014, 15, 16, 17, GRW 2014, 15, 16, 17, SWL 2016, 17, FSD 2014, 15, D.G.K 2014, 15, 16, 17, BWP 2017)

**Solution:**

$$|2x+5|=11$$

$$2x+5=\pm 11$$

$$2x+5=11$$

$$2x=11-5$$

$$2x=6$$

$$x=\frac{6}{2}$$

$$x=3$$

$$2x+5=-11$$

$$2x=-11-5$$

$$2x=-16$$

$$x=\frac{-16}{2}$$

$$x=-8$$

**Check**

$$|2x+5|=11$$

$$|2(-8)-8+5|=11$$

$$|2 \times 3+5|=11$$

$$|-16+5|=11$$

$$6+5=11$$

$$|-11|=11$$

$$11=11$$

$$11=11$$

**Solution Set** =  $\{-8, 3\}$

(iv)  $|3+2x|=|6x-7|$  (K.B)

(LHR 2015, 17, FSD 2016, SWL 2013, BWP 2017)

**Solution:**

$$|3+2x|=|6x-7|$$

$$3+2x=\pm(6x-7)$$

$$3+2x=6x-7$$

$$3+2x=-(6x-7)$$

$$3+7=6x-7$$

$$3+2x=-6x+7$$

$$10=4x$$

$$2x+6x=7-3$$

$$\frac{10}{4}=x$$

$$\frac{4}{8}=x$$

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

$$x=\frac{1}{2}$$

**Check**

$$|3+2x|=|6x-7|$$

$$|3+2x|=|6x-7|$$

$$\left|3+2\left(\frac{5}{2}\right)\right|=\left|6\left(\frac{5}{2}\right)-7\right|$$

$$\left|3+2 \times \frac{1}{2}\right|=\left|6^3 \times \frac{1}{2}-7\right|$$

$$|3+5|=|15-7|$$

$$|3+1|=|3-7|$$

$$|8|=|8|$$

$$|4|=|-4|$$

$$8=8$$

$$4=4$$

**Solution Set** =  $\left\{\frac{5}{2}, \frac{1}{2}\right\}$

(v)  $|x+2|-3=5-|x+2|$  (K.B)

**Solution:**

$$|x+2|-3=5-|x+2|$$

$$|x+2|+|x+2|=5+3$$

$$2|x+2|=8$$

$$|x+2|=\frac{8}{2}$$

$$|x+2|=4$$

$$x+2=\pm 4$$

$$x+2=4$$

$$x+2=-4$$

$$x=4-2$$

$$x=-4-2$$

$$x=2$$

$$x=-6$$

**Check**

$$|x+2|-3=5-|x+2|$$

$$|x+2|-3=5-|x+2|$$

$$|2+2|-3=5-|2+2|$$

$$|-6+2|-3=5-|-6+2|$$

$$4-3=5-4$$

$$|-4|-3=5-|-4|$$

$$4-3=5-4$$

$$4-3=5-4$$

$$1=1$$

$$1=1$$

**Solution Set** =  $\{-6, 2\}$

(vi)  $\frac{1}{2}|x+3|+21=9$  (K.B) + (U.B)

**Solution:**

$$\frac{1}{2}|x+3|+21=9$$

$$\frac{1}{2}|x+3|=9-21$$

$$\frac{1}{2}|x+3|=-12$$

$$|x+3|=-12 \times 2$$

$$|x+3|=-24$$

Value of absolute is never negative so solution is not possible

**Solution Set** =  $\{ \}$

(vii)  $\left|\frac{3-5x}{4}\right|-\frac{1}{3}=\frac{2}{3}$  (A.B)

**Solution:**

$$\left|\frac{3-5x}{4}\right|-\frac{1}{3}=\frac{2}{3}$$

## Unit - 7

## Linear Equations and Inequalities

$$\left| \frac{3-5x}{4} \right| = \frac{2}{3} + \frac{1}{3}$$

$$\left| \frac{3-5x}{4} \right| = \frac{2+1}{3}$$

$$\left| \frac{3-5x}{4} \right| = \frac{3}{3}$$

$$\left| \frac{3-5x}{4} \right| = 1$$

$$\frac{3-5x}{4} = \pm 1$$

$$\frac{3-5x}{4} = 1 \quad \text{and} \quad \frac{3-5x}{4} = -1$$

$$3-5x=4$$

$$-5x=4-3$$

$$-5x=1$$

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

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

$$3-5x=-4$$

$$-5x=-4-3$$

$$-5x=-7$$

$$x = \frac{-7}{-5}$$

$$x = \frac{7}{5}$$

$$\left| \frac{3-5 \times \left(-\frac{1}{5}\right)}{4} \right| - \frac{1}{3} = \frac{2}{3}$$

$$\left| \frac{3-5 \times \left(\frac{7}{5}\right)}{4} \right| - \frac{1}{3} = \frac{2}{3}$$

$$\left| \frac{3+1}{4} \right| - \frac{1}{3} = \frac{2}{3}$$

$$\left| \frac{4}{4} \right| - \frac{1}{3} = \frac{2}{3}$$

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

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

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

$$\text{Solution Set} = \left\{ -\frac{1}{5}, \frac{7}{5} \right\}$$

(viii)  $\left| \frac{x+5}{2-x} \right| = 6$

Solution:

$$\left| \frac{3-7}{4} \right| - \frac{1}{3} = \frac{2}{3}$$

$$\left| \frac{-4}{4} \right| - \frac{1}{3} = \frac{2}{3}$$

$$|-1| - \frac{1}{3} = \frac{2}{3}$$

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

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

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

(A.B)

$$\left| \frac{x+5}{2-x} \right| = 6$$

$$\frac{x+5}{2-x} = \pm 6$$

$$\frac{x+5}{2-x} = 6$$

$$x+5=6(2-x)$$

$$x+5=12-6x$$

$$x+6x=12-5$$

$$7x=7$$

$$x = \frac{7}{7}$$

$$x=1$$

$$\frac{x+5}{2-x} = -6$$

$$x+5=-6(2-x)$$

$$x+5=-12+6x$$

$$5+12=6x-x$$

$$17=5x$$

$$\frac{17}{5} = x$$

$$x = \frac{17}{5}$$

**Check**

$$\left| \frac{x+5}{2-x} \right| = 6$$

$$\left| \frac{1+5}{2-1} \right| = 6$$

$$\left| \frac{6}{1} \right| = 6$$

$$6=6$$

$$\left| \left( \frac{17}{5} + 5 \right) \div \left( 2 - \frac{17}{5} \right) \right| = 6$$

$$\left| \frac{17+25}{5} \div \frac{10-17}{5} \right| = 6$$

$$\left| \frac{42}{5} \div \frac{-7}{5} \right| = 6$$

$$|-6| = 6$$

## Unit - 7

## Linear Equations and Inequalities

---

$$6 = 6$$

$$\text{Solution Set} = \left\{ 1, \frac{17}{5} \right\}$$





Mathematics-9  
Unit 7 – Exercise 7.3

Download All Subjects Notes from website [www.lasthopestudy.com](http://www.lasthopestudy.com)

Q1 Solve the following inequalities

(i)  $-4 < 3x + 5 < 8$  (K.B)+(U.B)  
(SWL 2014, MTN 2015)

Solution:

$$\begin{aligned} -4 < 3x + 5 < 8 \\ -4 < 3x + 5 \quad \text{and} \quad 3x + 5 < 8 \\ -4 - 5 < 3x \quad \quad 3x < 8 - 5 \\ -9 < 3x \quad \quad 3x < 3 \\ \frac{-9}{3} < x \quad \quad x < \frac{3}{3} \\ -3 < x \quad \quad x < 1 \\ -3 < x < 1 \end{aligned}$$

Solution Set =  $\{x \mid -3 < x < 1\}$

(ii)  $-5 \leq \frac{4-3x}{2} < 1$  (SWL 2014) (A.B)

Solution:

$$\begin{aligned} -5 \leq \frac{4-3x}{2} < 1 \\ -5 \leq \frac{4-3x}{2} \quad \text{and} \quad \frac{4-3x}{2} < 1 \\ -10 \leq 4-3x \quad \quad 4-3x < 2 \\ 3x-10 \leq 4 \quad \quad -3x < 2-4 \\ 3x \leq 4+10 \quad \quad -3x < -2 \\ 3x \leq 14 \quad \quad x > \frac{-2}{-3} \\ x \leq \frac{14}{3} \quad \quad x > \frac{2}{3} \\ \frac{2}{3} < x \\ \frac{2}{3} < x \leq \frac{14}{3} \end{aligned}$$

Solution Set =  $\{x \mid \frac{2}{3} < x \leq \frac{14}{3}\}$

(iii)  $-6 < \frac{x-2}{4} < 6$  (A.B)

Solution:

$$-6 < \frac{x-2}{4} < 6$$

$$-6 < \frac{x-2}{4} \rightarrow (i) \quad \text{and} \quad \frac{x-2}{4} < 6 \rightarrow (ii)$$

$$(i) \Rightarrow -6 < \frac{x-2}{4}$$

$$-24 < x-2$$

$$-24+2 < x$$

$$-22 < x$$

and

$$(ii) \Rightarrow \frac{x-2}{4} < 6$$

$$x-2 < 24$$

$$x < 24+2$$

$$x < 26$$

$$-22 < x < 26$$

Solution Set =  $\{x \mid -22 < x < 26\}$

(iv)  $3 \geq \frac{7-x}{2} \geq 1$  (A.B)

Solution:

$$3 \geq \frac{7-x}{2} \geq 1$$

$$3 \geq \frac{7-x}{2} \rightarrow (i) \quad \text{and} \quad \frac{7-x}{2} \geq 1 \rightarrow (ii)$$

$$(i) \Rightarrow 3 \geq \frac{7-x}{2}$$

$$6 \geq 7-x$$

$$6-7 \geq -x$$

$$-1 \geq -x$$

Negative sign change the symbols

$$1 \leq x$$

$$(ii) \Rightarrow \frac{7-x}{2} \geq 1$$

## Unit - 7

## Linear Equations and Inequalities

$$7 - x \geq 2$$

$$-x \geq 2 - 7$$

$$-x \geq -5$$

$$x \leq 5$$

$$1 \leq x \leq 5$$

$$\text{Solution Set} = \{x \mid 1 \leq x \leq 5\}$$

(v)  $3x - 10 \leq 5 < x + 3$  (A.B)

**Solution:**

$$3x - 10 \leq 5 < x + 3$$

$$3x - 10 \leq 5 \quad \text{and} \quad 5 < x + 3$$

$$3x \leq 5 + 10 \quad 5 - 3 < x$$

$$3x \leq 15 \quad 2 < x$$

$$\frac{3x}{3} \leq \frac{15}{3}$$

$$x \leq 5$$

$$2 < x \leq 5$$

$$\text{Solution Set} = \{x \mid 2 < x \leq 5\}$$

(vi)  $-3 \leq \frac{x-4}{-5} < 4$  (A.B)

**Solution:**

$$-3 \leq \frac{x-4}{-5} < 4$$

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

$$-3 \times -5 \geq x - 4 \quad x - 4 > 4(-5)$$

$$15 \geq x - 4 \quad x > -20 + 4$$

$$15 + 4 \geq x \quad x > -16$$

$$19 \geq x \quad -16 < x$$

$$x \leq 19$$

$$-16 < x \leq 19$$

$$\text{Solution Set} = \{x \mid -16 < x \leq 19\}$$

(vii)  $1 - 2x < 5 - x \leq 25 - 6x$  (A.B)

**Solution:**

$$1 - 2x < 5 - x \leq 25 - 6x$$

$$1 - 2x < 5 - x \quad \text{and} \quad 5 - x \leq 25 - 6x$$

$$1 - 5 < 2x - x \quad -x + 6x \leq 25 - 5$$

$$-4 < x \quad 5x \leq 20$$

$$x \leq \frac{20}{5}$$

$$x \leq 4$$

$$-4 < x \leq 4$$

$$\therefore \text{Solution Set} = \{x \mid -4 < x \leq 4\}$$

(viii)  $3x - 2 < 2x + 1 < 4x + 17$  (A.B)

**Solution:**

$$3x - 2 < 2x + 1 < 4x + 17$$

$$3x - 2 < 2x + 1 \quad 2x + 1 < 4x + 17$$

$$3x - 2x - 2 < +1 \quad 2x - 4x < 17 - 1$$

$$x < 1 + 2 \quad -2x < 16$$

$$x < 3 \quad x > \frac{16}{-2}$$

$$x > -8$$

$$-8 < x$$

$$-8 < x < 3$$

$$\therefore \text{Solution Set} = \{x \mid -8 < x < 3\}$$

**Unit - 7**

**Linear Equations and Inequalities**



**Mathematics-9**  
**Unit 7 –Review Exercise 7**

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- Q.1 Choose the correct answer**
- (i) Which of the following is the solution of the inequality  $3-4x \leq 11$ ? **(A.B)**  
 (a)  $-8$  (b)  $-2$   
 (c)  $-\frac{14}{4}$  (d) None of these
- (ii) A statement involving any of the symbols  $<, >, \leq$  or  $\geq$ , is called----- **(K.B)**  
 (a) Equation (b) Identity  
 (c) Inequality (d) Linear equation
- (iii)  $x = \text{-----}$  is a solution of the inequality  $-z < x > \frac{3}{2}$  **(U.B)**  
 (a)  $-5$  (b)  $3$   
 (c)  $0$  (d)  $\frac{3}{2}$
- (iv) If  $x$  is no larger than  $10$ , then ----- **(U.B)**  
 (FSD 2014, 15, SWL 2017, RWP 2014, SGD 2014, D.G.K 2013)  
 (a)  $x \leq 8$  (b)  $x \geq 10$   
 (c)  $x < 10$  (d)  $x > 10$
- (v) If the capacity of an elevator is at most  $1600$  pounds then ----- **(K.B)**  
 (LHR 2013, GRW 2014, FSD 2014, 17, SWL 2014, 16)  
 (a)  $c < 1600$  (b)  $c \geq 1600$   
 (c)  $c \leq 1600$  (d)  $c > 1600$
- (vi)  $x = 0$  is a solution of the inequality ----- **(A.B)**  
 (a)  $x > 0$  (b)  $3x+5 < 0$   
 (c)  $x + \frac{z}{2} < 0$  (d)  $x-2 < 0$

**ANSWER KEY**

<b>i</b>	<b>ii</b>	<b>iii</b>	<b>iv</b>	<b>v</b>	<b>vi</b>
<b>b</b>	<b>c</b>	<b>c</b>	<b>b</b>	<b>C</b>	<b>d</b>

- Q.2 Identify the following statement as true or false** **(U.B)**
- (i) The equation  $3x-5=7-x$  is a linear equation. **(True)**
- (ii) The equation  $x-0.3x=0.7x$  is an identity **(True)**
- (iii) The equation  $-2x+3=8$  is equivalent to  $-2x=11$  **(False)**
- (iv) To eliminate fractions we multiply each side of an equation by the L.C.M of denominators **(True)**
- (v)  $4(x+3)=x+3$  is a conditional equations **(True)**
- (vi) The equation  $2(3x+5)=6x+12$  is an in consistent equation **(True)**

## Unit - 7

## Linear Equations and Inequalities

(vii) To solve  $\frac{2}{3}x = 12$ , we should multiply each side by  $\frac{2}{3}$  (False)

(viii) Equations having exactly the same solution are called equivalent equations. (True)

(ix) A solution that does not satisfy the original equation is called extra solution (True)

**Q.3** Answer the following short question.

(i) Define a linear inequality in one variable (K.B)

**Ans** A linear inequality in one variable  $x$  is an inequality in which the variable  $x$  occurs only to the first power and has the standard form  $ax + b < 0$ ,  $a \neq 0$

(ii) State the Trichotomy and transitive properties of in equalities (K.B)

**Ans** **Trichotomy Property** (K.B)

For any  $a, b \in R$  one and only one of the following statements in true.  $a < b$  or  $a = b$ , or  $a > b$

**Transitive Property**

Let  $a, b, c \in R$ .

(a) If  $a > b$  and  $b > c$ , then  $a > c$

(b) If  $a < b$  and  $b < c$ , then  $a < c$

(iii) The formula relating degree Fahrenheit to degree Celsius is  $F = \frac{9}{5}c + 32$  for what value of  $c$  is  $F < 0$  was (K.B) + (A.B) + (U.B)

**Ans**  $F = \frac{9}{5}c + 32$

$$\frac{9}{5}c + 32 = F$$

Since  $F < 0$

So  $\frac{9}{5}c + 32 < 0$

$$\frac{9c + 160}{5} < 0$$

Or  $9c + 160 < 0 \times 5$

Or  $9c + 160 < 0$

Or  $9c < -160$

Or  $c < -\frac{160}{9}$

(iv) Seven times the sum of an integer and 12 is at least 50 and at most 60. Write and solve the inequality that expresses this relationship (U.B)

**Solution:** Let the integer =  $y$

Sum of integer and 12 =  $y + 12$

Seven times sum of integer and 12 =  $7(y + 12)$

According to condition

$$50 \leq 7(y + 12) \leq 60$$

$$\frac{50}{7} \leq 7 \frac{(y + 12)}{7} \leq \frac{60}{7}$$

$$\frac{50}{7} \leq y + 12 \leq \frac{60}{7}$$

$$\frac{50}{7} - 12 \leq y + \cancel{12} - \cancel{12} \leq \frac{60}{7} - 12$$



## Unit - 7

## Linear Equations and Inequalities

$$\frac{50-84}{7} \leq y \leq \frac{60-84}{7}$$

$$\frac{-34}{7} \leq y \leq \frac{-24}{7} \quad \text{Solution Set} = \left\{ y \mid \frac{-34}{7} \leq y - \frac{24}{7} \right\}$$

**Q.4** Solve each of the following and check for extraneous solution if any

(i)  $\sqrt{2t+4} = \sqrt{t-1}$  (A.B)

**Solution:**  $\sqrt{2t+4} = \sqrt{t-1}$

Taking square on both side

$$(\sqrt{2t+4})^2 = (\sqrt{t-1})^2$$

$$2t+4 = t-1$$

$$2t-t = -1-4$$

$$t = -5$$

To check

$$\sqrt{2t+4} = \sqrt{t-1}$$

When  $t = -5$

$$\sqrt{2(-5)+4} = \sqrt{-5-1}$$

$$\sqrt{-10+4} = \sqrt{-6}$$

$$\sqrt{-6} = \sqrt{-6}$$

L.H.S = R.H.S

$$\text{Solution Set} = \{-5\}$$

(ii)  $\sqrt{3x-1} - 2\sqrt{8-2x} = 0$  (A.B)

**Solution:**  $\sqrt{3x-1} - 2\sqrt{8-2x} = 0$

$$\sqrt{3x-1} = 2\sqrt{8-2x}$$

Taking square on both side

$$(\sqrt{3x-1})^2 = (2\sqrt{8-2x})^2$$

$$3x-1 = 4(8-2x)$$

$$3x-1 = 32-8x$$

$$3x+8x = 32+1$$

$$11x = 33$$

$$x = \frac{33}{11}$$

$$x = 3$$

To check

$$\sqrt{3x-1} - 2\sqrt{8-2x} = 0$$

When  $x = 3$

$$\sqrt{3(3)-1} - 2\sqrt{8-2(3)} = 0$$

$$\sqrt{9-1} - 2\sqrt{8-6} = 0$$

$$\sqrt{8} - 2\sqrt{2} = 0$$



## Unit - 7

## Linear Equations and Inequalities

$$2\sqrt{2} - 2\sqrt{2} = 0$$

$$0 = 0$$

$$\text{L.H.S} = \text{R.H.S}$$

$$\text{Solution Set} = \{3\}$$

**Q.5 Solve for  $x$**

(i)  $|3x+14| - 2 = 5x$

(A.B)

**Solution:**  $|3x+14| - 2 = 5x$

$$|3x+14| = 5x+2$$

$$3x+14 = \pm(5x+2)$$

$$3x+14 = 5x+2$$

$$3x+14 = -(5x+2)$$

$$14-2 = 5x-3x$$

$$12 = 2x$$

$$3x+14 = -5x-2$$

$$\frac{12}{2} = x$$

$$3x+5x = -2-14$$

$$x = 6$$

$$8x = \frac{-16}{8}$$

To check

$$x = -2$$

$$|3x+14| - 2 = 5x$$

$$|3x+14| - 2 = 5x$$

When  $x = 6$

when  $x = -2$

$$|3(6)+14| - 2 = 5(6)$$

$$|3(-2)+14| - 2 = 5(-2)$$

$$|18+14| - 2 = 30$$

$$|-6+14| - 2 = -10$$

$$32-2=30$$

$$8-2 = -10$$

$$30 = 30$$

$$6 = -10$$

$$\text{Solution Set} = \{6\}$$

(ii)  $\frac{1}{3}|x-3| = \frac{1}{2}|x+2|$

(A.B)

**Solution**  $\frac{1}{3}|x-3| = \frac{1}{2}|x+2|$

$$\frac{2}{3}|x-3| = |x+2|$$

$$\frac{2}{3} = \frac{|x+2|}{|x-3|}$$

$$\frac{x+2}{x-3} = \pm \frac{2}{3}$$

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

and

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

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

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

$$3x+6 = 2x-6$$

$$3x+6 = -2x+6$$

$$3x-2x = -6-6$$

$$3x+2x = +6-6$$

## Unit - 7

## Linear Equations and Inequalities

$$x = -12$$

To check

$$\frac{1}{3}|x-3| = \frac{1}{2}|x+2|$$

When  $x = -12$

$$\frac{1}{3}|-12-3| = \frac{1}{2}|-12+2|$$

$$\frac{1}{3}|-15| = \frac{1}{2}|-10|$$

$$\frac{1}{3}(15^5) = \frac{1}{2}(10^5)$$

$$5 = 5$$

**Solution Set** =  $\{-12, 0\}$

$$5x = 0$$

$$x = \frac{0}{5} \Rightarrow x = 0$$

$$\frac{1}{3}|x-3| = \frac{1}{2}|x+2|$$

when  $x = 0$

$$\frac{1}{3}|0-3| = \frac{1}{2}|0+2|$$

$$\frac{1}{3}|-3| = \frac{1}{2}|2|$$

$$\frac{1}{3}(3^1) = \frac{1}{2}(2^1)$$

$$\frac{1}{3}(3) = 1$$

$$1 = 1$$

**Q.6** Solve the following inequality

(iii)  $-\frac{1}{3}x + 5 \leq 1$

(U.B)+(K.B)

**Solution**  $-\frac{1}{3}x + 5 \leq 1$

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

$$-\frac{1}{3}x \leq -4$$

$$x \geq -4 \times (-3)$$

$$x \geq 12$$

**Solution Set** =  $\{x | x \geq 12\}$

(i)  $-3 < \frac{1-2x}{5} < 1$

**Solution**  $-3 < \frac{1-2x}{5} < 1$

$$-3 < \frac{1-2x}{5}$$

$$-15 < 1-2x$$

$$-15-1 < -2x$$

$$-16 < -2x$$

$$\frac{-16}{-2} > x$$

$$8 > x$$

$$x < 8$$

$$\frac{1-2x}{5} < 1$$

$$1-2x < 5$$

$$-2x < 5-1$$

$$-2x < 4$$

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

$$x > -2$$

$$-2 < x$$

$$-2 < x < 8$$



## Unit - 7

## Linear Equations and Inequalities

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$$\text{Solution Set} = \{x \mid -2 < x < 8\}$$



CUT HERE

**SELF TEST**

Time: 40 min

Marks: 25

Q.1 Four possible answers (A), (B), (C) & (D) to each question are given, mark the correct answer. (7×1=7)

1 If capacity “C” of an elevator is at most 1600 pounds then \_\_\_\_

- (A)  $C < 1600$  (B)  $C \leq 1600$   
(C)  $C \geq 1600$  (D)  $C > 1600$

2  $x = 0$  is a solution of the inequality \_\_\_\_\_

- (A)  $x > 0$  (B)  $3x + 5 < 0$   
(C)  $x + 2 < 0$  (D)  $x - 2 < 0$

3 \_\_\_\_ is the member of the solution set of inequality  $-2 < x < \frac{3}{2}$ .

- (A) -5 (B) 0  
(C)  $\frac{3}{2}$  (D) 3

4 The solution set of  $|x - 4| = -4$  is:

- (A) -8 (B) -16  
(C) { } (D) 4

5 Which of the solution set of the inequality  $9 - 7x > 19 - 2x$

- (A) 19 (B) -7  
(C) 2 (D) -2

6 The value of “x” from the equation  $\sqrt{2x - 3} - 7 = 0$  is:

- (A) 7 (B) 49  
(C) 52 (D) 26

7 The general form of linear equation in one variable  $x$  is

- (A)  $ax + by + c$  (B)  $ax^2 + bx + c$   
(C)  $ax + b = 0$  (D)  $ax + by + cz = 0$

**Q.2 Give Short Answers to following Questions.****(5×2=10)**

(i) Find the solution set of  $\frac{3}{y-1} - 2 = \frac{3y}{y-1}$ ,  $y \neq 1$

(ii) Solve the inequality:  $4x - 10.3 \leq 21x - 1.8$

(iii) Solve the inequality:  $4 - \frac{1}{2}x \geq -7 + \frac{1}{4}x$

(iv) Solve:  $\left| \frac{3-5x}{4} \right| - \frac{1}{3} = \frac{2}{3}$

(v) Solve the radical equation:  $\sqrt[3]{2x+3} = \sqrt[3]{x-2}$

**Q.3 Answer the following Questions.****(4+4=8)**

(a) Solve the inequality:  $x - 2(5 - 2x) \geq 6x - 3\frac{1}{2}$

(b) Solve the equation and check for extraneous root:  $\sqrt{\frac{x+1}{2x+5}} = 2$ ,  $x \neq \frac{-5}{2}$

**NOTE:** Parents or guardians can conduct this test in their supervision in order to check the skill of students.