* CLASS 9th

MATHS

* EXERCISE

NO:- 5.1

* Q NO:- (1 - 13)

DONE!

* Linear Equation :-

$2x + 3 = 0$ ONE variable

$2x + 4y = 1$ TWO variable

#05

EXERCISE # 5.1

Basic Concept:

Linear equation in one variable:

$2x+3=0$

Two variable:

$2x+y=3$

*) Variable:
(Exponent / Power of variable is always 1)

*) unknown

Linear equation is also called equation of degree one (Means x ke Power 1)

Solve the following linear equations in one variable.

Q#1):

$5x-2-x=4-3x-27$

Solve

$5x-2-x=4-3x-27$

$5x-x-2=-3x+4-27$

$4x-2=-3x-23$

$4x+3x=-23+2$

$7x=-21$

$x=\frac{-21}{7}$

$\boxed{x=-3}$

Check:-

put $x=-3$ in given equation

$5x-2-x=4-3x-27$

$5(-3)-2-(-3)=4-3(-3)-27$

$-15-2+3=4+9-27$

$-17+3=13-27$

$-14=-14$

L.H.S = R.H.S

S.S = $\{-3\}$

Q#2:-

$4a-3(5a-14)=5(7+a)-9$

Solve:-

$4a-3(5a-14)=5(7+a)-9$

$4a-15a+42=35+5a-9$

$-11a+42=35-9+5a$

$-11a+42=26+5a$

$-11a-5a=26-42$

$+16a=+16$

$16a=16$

$a=\frac{16}{16}$

$\boxed{a=1}$

S.S = $\{1\}$

Q#3:-

$7(2-5x)+27=18x-3(8-4x)$

Solve:-

$7(2-5x)+27=18x-3(8-4x)$

$14-35x+27=18x-24+12x$

$14+27-35x=18x+12x-24$

$41-35x=30x-24$

$41+24=30x+35x$

$65=65x$

$\frac{65}{65}=x$

$\boxed{1=x}$

S.S = $\{1\}$

Q#4:-

$\frac{5x}{4}+\frac{1}{2}=0$

Solve

$\frac{5x}{4}+\frac{1}{2}=0$

LCM = 4

Multiply 4 on b/s

$4(\frac{5x}{4})+4(\frac{1}{2})=0\times4$

$1(5x)+2(1)=0$

$5x+2=0$

$5x=-2$

$\boxed{x=-2/5}$

2	4,
2	2,
	1, 1

$2\times2=4$

Q#5:-

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

Solve

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

LCM = 10

Multiply 10 on b/s

2	2, 5
5	1, 5
	1, 1

$2\times5=10$

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

$$5(x-2)+2(x+10)=5$$
$$5x-10+2x+20=5$$
$$5x+2x+20-10=5$$
$$7x+10=5$$
$$7x=5-10$$
$$7x=-5$$
$$\boxed{x=-\frac{5}{7}}$$

$$S.S=\left\{-\frac{5}{7}\right\}$$

Q#06

$$\frac{4(x+2)}{3}-\frac{6(x-7)}{7}=12$$

Solve:-

$$\frac{4(x+2)}{3}-\frac{6(x-7)}{7}=12$$

3	3, 7
7	1, 7
	1, 1

$3\times7=21$

LCM = 21

Multiply '21' on b/s:-

$$\frac{7}{21}\times\frac{4(x+2)}{3}-\frac{3}{21}\times\frac{6(x-7)}{7}=12\times21$$
$$7\times4(x+2)-3\times6(x-7)=252$$
$$28(x+2)-18(x-7)=252$$
$$28x+56-18x+126=252$$
$$28x-18x+56+126=252$$
$$10x+182=252$$
$$10x=252-182$$
$$10x=70$$
$$x=\frac{70}{10}$$
$$\boxed{x=7}$$

Q#07.

$$\frac{x}{2}+\frac{x}{3}-\frac{x}{4}+\frac{x}{5}=\frac{75}{6}$$

Solve

$$\frac{x}{2}+\frac{x}{3}-\frac{x}{4}+\frac{x}{5}=\frac{75}{6}$$

$$\frac{x}{2}+\frac{x}{3}-\frac{x}{4}+\frac{x}{5}=\frac{47}{6}$$

2	2, 3, 4, 5, 6
2	1, 3, 2, 5, 3
3	1, 3, 1, 5, 3
5	1, 1, 1, 5, 1
	1, 1, 1, 1, 1

$2\times2\times3\times5=60$

Multiply '60' on b/s:-

$$\frac{30}{60}\times\frac{x}{2}+\frac{20}{60}\times\frac{x}{3}-\frac{15}{60}\times\frac{x}{4}+\frac{12}{60}\times\frac{x}{5}=\frac{10}{60}\times\frac{47}{6}$$
$$30x+20x-15x+12x=10\times47$$
$$30x+20x-15x+12x=470$$
$$50x-3x=470$$
$$47x=470$$
$$x=\frac{470}{47}$$
$$\boxed{x=10}$$

$$S.S=\{10\}$$

Q.NO:- 8

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

Solve:-

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

3	3, 2, 2
2	1, 2, 2
	1, 1, 1

$3\times2=6$

LCM = 6

Multiply '6' on b/s:-

$$\frac{2}{6}\times\frac{(y+1)}{3}+\frac{3}{6}\times\frac{(y+1)}{2}=6\times2-6\times\frac{(y+3)}{2}$$

$$2(y+1)+3(y+1)=12-3(y+3)$$

$$2y+2+3y+3=12-3y-9$$

$$2y+3y+2+3=12-9-3y$$

$$5y+5=+3-3y$$

$$5y+3y=3-5$$

$$8y=-2$$

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

$$\boxed{y=-\frac{1}{4}}$$

$$\therefore S=\left\{-\frac{1}{4}\right\}$$

Q#9):-

$$\frac{1}{5}(x-8)+\frac{4+x}{7}=7-\frac{23-x}{5}$$

Solve:-

$$\frac{1}{5}(x-8)+\frac{4+x}{7}=7-\frac{23-x}{5}$$

LCM = 35

Multiply '35' on b/s:

5	7, 5
7	7, 1
	1, 1

$5\times7=35$

$$\frac{7}{35}\times\frac{1}{5}(x-8)+\frac{5}{35}\times\frac{(4+x)}{7}=35\times7-\frac{7}{35}\times\frac{(23-x)}{5}$$

$$7\times1(x-8)+5\times(4+x)=245-7\times(23-x)$$

$$7(x-8)+20+5x=245-161+7x$$

$$7x-56+20+5x=84+7x$$

$$7x+5x-56+20=84+7x$$

$$12x-36=84+7x$$

$$12x-7x=84+36$$

$$5x=120$$

$$x=\frac{120}{5}$$

$$\boxed{x=24}$$

$$\therefore S=\{24\}$$

Q#10):-

$$\frac{1}{2y}-\frac{1}{6}=\frac{1}{4y}-1-\frac{1}{y}$$

Solve:-

$$\frac{1}{2y}-\frac{1}{6}=\frac{1}{4y}-1-\frac{1}{y}$$

LCM = 12

Multiply '12y' on b/s:

2	2, 6, 4
2	1, 3, 2
3	1, 3, 1
	1, 1, 1

$2 \times 2 \times 3 = 12$

$$\frac{12y}{2y} \times 1 - \frac{12y}{6} \times 1 = \frac{12y}{4y} \times 1 - 12 \times 1 - 12y \times \frac{1}{y}$$

$$6 \times 1 - 2y \times 1 = 3 \times 1 - 12y - 12 \times 1$$

$$6 - 2y = 3 - 12y - 12$$

$$6 - 2y = 3 - 12 - 12y$$

$$6 - 2y = -9 - 12y$$

$$-2y + 12y = -9 - 6$$

$$10y = -15$$

$$y = \frac{-15}{10}$$

$$\boxed{y = -\frac{3}{2}}$$

Q#11):-

$4 - 0.3(1 - x) = 7$

Solve:

$4 - 0.3(1 - x) = 7$

$4 - 0.3 + 0.3x = 7$

$3.7 + 0.3x = 7$

$0.3x = 7 - 3.7$

$0.3x = 3.3$

$x = \frac{3.3}{0.3}$

$$\boxed{x = 11}$$

$S.S = \{11\}$

Q NO: 12)

$0.5x = 6.3 - 0.2x$

Solve:-

$0.5x = 6.3 - 0.2x$

$0.5x + 0.2x = 6.3$

$0.7x = 6.3$

$x = \frac{6.3}{0.7}$

$\boxed{x = 9}$

$S.S = \{9\}$

Q NO: 13)

$1.3x - 0.2 = 0.3x - 1.5$

Solve:

$1.3x - 0.2 = 0.3x - 1.5$

$1.3x - 0.3x = -1.5 + 0.2$

$1x = -1.3$

$x = -\frac{1.3}{1}$

$\boxed{x = -1.3}$

$S.S = \{-1.3\}$