NEW ERA PUBLIC SCHOOL

Solved Assignment for Unit 1

CLASS: 8th Subject: MATHS

SYLLABUS:

- Chapter 1: Rational No's
- Chapter 2: Linear Equation in one Variable.

Chapter 1: RATIONAL NUMBERS

Rational No's: The no. of the form P/q, where P & q are integers and $(q \neq 0)$ are called rational no's.
e.g $3/4$, $5/3$, $2/9$, $-6/11$ etc.

Additive Identity Element:
Zero is the identity element for addition and subtraction of natural no's, whole no's, integers and rational no's. e.g

$3+0 = 0+3 = 3$

$3/4 + 0 = 0 + 3/4 = 3/4$ etc

Multiplicative Identity:
One is the Multiplicative identity for natural no's, whole no's integers and rational no's e.g

$6 \times 1 = 1 \times 6 = 6$

$5/3 \times 1 = 1 \times 5/3 = 5/3$ etc.

EXERCISE 1.1

Q1: Using appropriate properties find:

(i) $-2/3 \times 3/5 + 5/2 - 3/5 \times 1/6$

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

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

Using $a \times (b-c) = (a \times b) - (a \times c)$

$\Rightarrow \frac{3}{5} \times \left[\frac{-2}{3} - \frac{1}{6}\right] + \frac{5}{2}$ → [3/5 is Common] P2

$\Rightarrow \frac{3}{5} \times \left[\frac{(-2\times2) - (1\times1)}{6}\right] + \frac{5}{2}$

$\Rightarrow \frac{3}{5} \times \left[\frac{-4-1}{6}\right] + \frac{5}{2}$

$\Rightarrow \frac{\cancel{3}^{1}}{\cancel{5}} \times \frac{-\cancel{5}}{\cancel{6}_{2}} + \frac{5}{2}$

$\Rightarrow \frac{-1}{2} + \frac{5}{2}$

$\Rightarrow \frac{-1+5}{2} = \frac{\cancel{4}^{2}}{\cancel{2}_{1}} = 2.$

ii) $\frac{2}{5} \times \left(\frac{-3}{7}\right) - \frac{1}{6} \times \frac{3}{2} + \frac{1}{14} \times \frac{2}{5}$

Sol:→ $\frac{2}{5} \times \left(\frac{-3}{7}\right) - \frac{1}{6} \times \frac{3}{2} + \frac{1}{14} \times \frac{2}{5}$

$\Rightarrow \left[\frac{2}{5} \times \left(\frac{-3}{7}\right) + \frac{1}{14} \times \frac{2}{5}\right] - \frac{1}{\cancel{2}\cancel{6}} \times \frac{\cancel{3}^{1}}{2}$

using $a \times (b+c) = (a \times b) + (a \times c)$

$\Rightarrow \frac{2}{5} \times \left[\frac{-3}{7} + \frac{1}{14}\right] - \frac{1}{4}$

$\Rightarrow \frac{2}{5} \times \left[\frac{(-3\times2) + (1\times1)}{14}\right] - \frac{1}{4}$

$\Rightarrow \frac{2}{5} \times \left[\frac{-6+1}{14}\right] - \frac{1}{4}$

$\Rightarrow \frac{\cancel{2}^{1}}{\cancel{5}} \times \frac{-\cancel{5}}{\cancel{14}_{7}} - \frac{1}{4}$

$\Rightarrow \frac{-1}{7} - \frac{1}{4}$

$\Rightarrow \frac{(-1\times4) - (1\times7)}{28} = \frac{-4-7}{28} = \frac{-11}{28}.$

Q2:→ write the additive inverse of each of the following: P3

i) 2/8

Sol:→ The additive inverse of 2/8 is -2/8

Because $\frac{-2}{8} + \frac{2}{8} = \frac{-2+2}{8} = \frac{0}{8} = 0.$

iii) $-6/-5 = 6/5$

Sol:→ The additive inverse of 6/5 is -6/5

Because $\frac{-6}{5} + \frac{6}{5} = \frac{-6+6}{5} = \frac{0}{5} = 0.$

Q3:→ Verify that $-(-x) = x$ for.

i) $x = \frac{11}{15}$

Sol:→ The additive inverse of $x = \frac{11}{15}$ is $-x = \frac{-11}{15}$

Since $\frac{11}{15} + \left(\frac{-11}{15}\right) = 0.$

The additive inverse of $-(-x) = x$ i.e $-\left(\frac{-11}{15}\right)$ is $\frac{11}{15}$.

Q4:→ Find the multiplicative inverse of the following:

i) -13

Sol:→ The multiplicative inverse of -13 is 1/-13

because $-13 \times \frac{1}{-13} = 1.$

ii $\frac{-13}{19} \Rightarrow \frac{19}{-13}$ iii) $\frac{1}{5} = 5$

iv) $\frac{-5}{8} \times \frac{-3}{7} = \frac{+15}{56}$

∴ Multiplicative inverse of 15/56 is 56/15.

v) $-1 \times \frac{-2}{5} = \frac{2}{5}$

∴ Multiplicative inverse of 2/5 is 5/2.

vi) $-1 \Rightarrow$ Multiplicative inverse of -1 is -1.

Q5):→ Name the property under multiplication used in each of the following

i) $\frac{-4}{5} \times 1 = 1 \times \frac{-4}{5} = \frac{-4}{5}$ ⇒ 1 is the multiplicative identity

ii) $\frac{-13}{17} \times \frac{-2}{7} = \frac{-2}{7} \times \frac{-13}{17}$ ⇒ Commutativity property.

iii) $\frac{-19}{29} \times \frac{29}{-19} = 1$ ⇒ Multiplicative inverse.

Q6:→ Multiply 6/13 by the reciprocal of $-7/16$.

Sol:→ Reciprocal of $\frac{-7}{16}$ is $\frac{16}{-7}$

Ac. to Q.

$$\frac{6}{13} \times \frac{16}{-7} = \frac{96}{-91}.$$

Q7:→ Tell what property allows you to compute $\frac{1}{3} \times \left(6 \times \frac{4}{3}\right)$ as $\left(\frac{1}{3} \times 6\right) \times \frac{4}{3}$.

Sol:→ $\frac{1}{3} \times \left(6 \times \frac{4}{3}\right) = \frac{1}{\cancel{3}_1} \times \left(\frac{\overset{8}{\cancel{24}}}{3}\right) = \frac{8}{3}$

and $\left(\frac{1}{3} \times 6\right) \times \frac{4}{3} = \frac{\overset{2}{\cancel{6}}}{3} \times \frac{4}{\cancel{3}_1} = \frac{8}{3}$

Here $\frac{1}{3} \times \left(6 \times \frac{4}{3}\right) = \left(\frac{1}{3} \times 6\right) \times \frac{4}{3}$

for any rational no's a, b and c.

$$(a \times b) \times c = a \times (b \times c).$$

The Multiplication is associative for rational numbers.

Q8:→ Is $\frac{8}{9}$ the multiplicative inverse of $-1\frac{1}{8}$? Why or why not.

Sol:→ No, Because $-1\frac{1}{8} = \frac{-9}{8}$

but the rational number, 8/9 is positive.

Q9:→ Is 0.3 the multiplicative inverse of $3\frac{1}{3}$? Why or why not?

Sol:→ $3\frac{1}{3} = \frac{10}{3}$

∴ Multiplicative inverse of $\frac{10}{3}$ is $\frac{3}{10}$

⇒ $\frac{3}{10} = 0.3$

∴ Yes 0.3 is the multiplicative inverse of $3\frac{1}{3}$.

Q10:→ Write:

i) The rational number that does not have a reciprocal.

Sol:→ Zero (0).

ii) The rational numbers that are equal to their reciprocals

Sol:→ 1 and (-1).

iii) The rational number that is equal to its negative.

Sol:→ Zero (0).

Q11:→ Fill in the blanks:

i) Zero has no reciprocals.

ii) The numbers 1 and -1 are their own reciprocals.

iii) The reciprocal of -5 is $\frac{1}{-5}$

iv) Reciprocal of $\frac{1}{x}$, where $x \neq 0$ is x

v) The product of two rational no.'s is always a Rational no.

vi) The reciprocal of a positive rational no. is Positive.

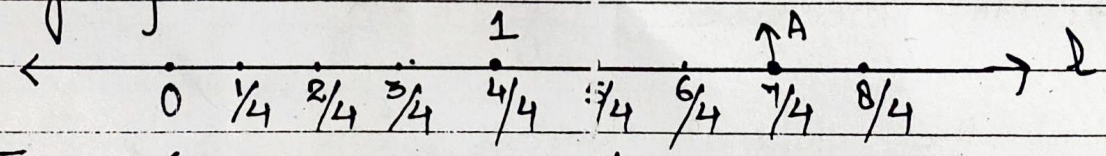
[Note: Solve & practice remaining parts by yourself]

Exercise No: 1.2

Q1:→ Represent these numbers on the number line:

(i) 7/4.

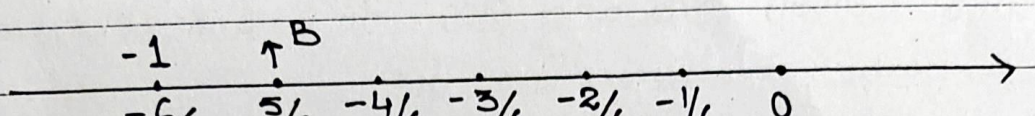
Sol:→ To represent 7/4, we make 7 marking of distance 1/4 on the right of 0.



Thus, point A represents 7/4.

ii) $-5/6$.

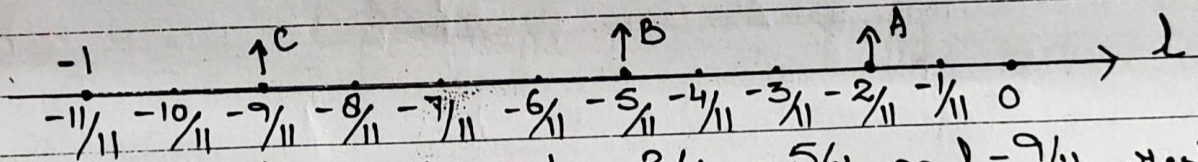
Sol:→ To represent $-5/6$, we make 5 markings of distance $1/6$ each on the left of zero (0).



Thus, point B represents $-\frac{5}{6}$.

Q2:→ Represent $-2/11$, $-5/11$, $-9/11$ on the number line:

Sol:→ Draw a line l. Take a point O on it. From O mark 11 distances at $1/11$ each on the left of O.



Thus, points A, B & C represent $-2/11$, $-5/11$ and $-9/11$ resp.

Q3):→ Write five rational numbers which are smaller than 2.

Sol:→ We take 0 and 2 because 0 is smaller than 2.

Now 2 can be written as $\frac{20}{10}$ and 0 as $\frac{0}{10}$.

Thus, we have $\frac{19}{10}, \frac{18}{10}, \frac{17}{10}, \frac{16}{10}, \ldots\ldots\ldots \frac{2}{10}, \frac{1}{10}$

between 2 and 0. → (you can take any five values)

Q4):→ Find ten rational numbers between $-2/5$ and $1/2$.

Sol:→ First we make same denominators of the given rational numbers.

$$\frac{-2}{5} = \frac{-2}{5} \times \frac{2}{2} = \frac{-4}{10} \Rightarrow \frac{-4}{10} \times \frac{2}{2} = \frac{-8}{20}$$

& $\frac{1}{2} = \frac{1}{2} \times \frac{5}{5} = \frac{5}{10} \Rightarrow \frac{5}{10} \times \frac{2}{2} = \frac{10}{20}$

Thus, we have $-\frac{7}{20}, -\frac{6}{20}, -\frac{5}{20}, \ldots\ldots\ldots \frac{8}{20}, \frac{9}{20}$

between $-2/5$ and $1/2$.

You can take any ten of these values.

Q5) :→ Find five rational numbers between.

i) $2/3$ and $4/5$.

Sol) :→ We first convert $2/3$ and $4/5$ to rational numbers with the same denominators i.e.

$$\frac{2}{3} = \frac{2}{3} \times \frac{5}{5} = \frac{10}{15} \Rightarrow \frac{10}{15} \times \frac{3}{3} = \frac{30}{45}$$

and $$\frac{4}{5} = \frac{4}{5} \times \frac{3}{3} = \frac{12}{15} \Rightarrow \frac{12}{15} \times \frac{3}{3} = \frac{36}{45}$$

Thus, we have $\frac{35}{45}, \frac{34}{45}, \frac{33}{45}, \frac{32}{45}, \frac{31}{45}$.

→ [Do remaining parts by yourself]

Q6) :→ Write five rational numbers greater than -2.

Sol) :→ We take -2 and 0 because 0 is greater than -2.

Now -2 can be written as $\frac{-20}{10}$ and 0 as $\frac{0}{10}$.

Thus, we have $\frac{-19}{10}, \frac{-18}{10}, \frac{-17}{10}, \frac{-16}{10}, \ldots\ldots \frac{-2}{10}, \frac{-1}{10}$,

(You can take any five of these values)

Q7) :→ Find ten rational numbers between $3/5$ & $3/4$.

Sol) :→ First we make same denominators of the given rational numbers.

$$\frac{3}{5} = \frac{3}{5} \times \frac{4}{4} = \frac{12}{20} \Rightarrow \frac{12}{20} \times \frac{4}{4} = \frac{48}{80}$$

& $$\frac{3}{4} = \frac{3}{4} \times \frac{5}{5} = \frac{15}{20} \Rightarrow \frac{15}{20} \times \frac{4}{4} = \frac{60}{80}$$

Thus, we have $\frac{59}{80}, \frac{58}{80}, \frac{57}{80}, \frac{56}{80}, \frac{55}{80}, \frac{54}{80}, \frac{53}{80}, \frac{52}{80}, \frac{51}{80}, \frac{50}{80} \ldots$

Note :→ Practice whole UNIT - I thoroughly for examination.

CHAPTER : LINEAR EQUATION IN ONE VARIABLE

LESSON NO : 02

Exercise No : 2.1

Solve the following equations:

1) $x - 2 = 7$

Sol:→ $x - 2 = 7$

$\Rightarrow x = 2 + 7$

$\Rightarrow x = 9$

2) $y + 3 = 10$

Sol:→ $y + 3 = 10$

$\Rightarrow y = 10 - 3$

$\Rightarrow y = 7$

3) $6 = z + 2$

Sol:→ $6 = z + 2$

$\Rightarrow 6 - 2 = z$

$\Rightarrow 4 = z$

OR $z = 4$

4) $\frac{3}{7} + x = \frac{17}{7}$

Sol:→ $\frac{3}{7} + x = \frac{17}{7}$

$\Rightarrow x = \frac{17}{7} - \frac{3}{7}$

$\Rightarrow x = \frac{17-3}{7} = \frac{\cancel{14}^{2}}{\cancel{7}_{1}} = 2$

5) $6x = 12$

Sol:→ $6x = 12$

$\Rightarrow x = \frac{\cancel{12}^{2}}{\cancel{6}_{1}}$

$\Rightarrow x = 2$

6) $\frac{t}{5} = 10$

Sol:→ $\frac{t}{5} = 10$ — by CM

$\Rightarrow t = 10 \times 5$

$\Rightarrow t = 50$

7) $\frac{2}{3}x = 18$

Sol:→ $\frac{2}{3}x = 18$

$\Rightarrow 2x = 18 \times 3$

$\Rightarrow x = \frac{\cancel{18}^{9} \times 3}{\cancel{2}_{1}}$

$\Rightarrow x = 9 \times 3$

$\Rightarrow x = 27$

8) $1.6 = \frac{y}{1.5}$

Sol:→ $1.6 = \frac{y}{1.5}$

$\Rightarrow y = 1.6 \times 1.5$

$\Rightarrow y = 16 \times 15$ → RD

$\Rightarrow y = 240$

9) $7x - 9 = 16$

Sol:→ $7x - 9 = 16$

$\Rightarrow 7x = 16 + 9$

$\Rightarrow 7x = 25$

$\Rightarrow x = \frac{25}{7}$

10) $14y - 8 = 13$

Sol:→ $14y - 8 = 13$

$\Rightarrow 14y = 13 + 8$

$\Rightarrow 14y = 21$

$\Rightarrow y = \frac{\cancel{21}^{3}}{\cancel{14}_{2}}$

$\Rightarrow y = 3/2$

11) $17 + 6p = 9$

Sol:→ $17 + 6p = 9$

$\Rightarrow 6p = 9 - 17$

$\Rightarrow 6p = -8$

$\Rightarrow p = \frac{-\cancel{8}^{4}}{\cancel{6}_{3}}$

$\Rightarrow p = -\frac{4}{3}$

12.) $x/3 + 1 = 7/15$

Sol:→ $x/3 + 1 = 7/15$

$\Rightarrow \frac{x}{3} = \frac{7}{15} - 1$

$\Rightarrow \frac{x}{3} = \frac{7 - 15}{15}$

$\Rightarrow \frac{x}{3} = -\frac{8}{15}$

$\Rightarrow x = -\frac{8}{\cancel{15}_{5}} \times \cancel{3}^{1}$

$\Rightarrow x = -8/5.$

Exercise No: 2.2

Note: Questions on book on page no.: 29

Q1:→ Let the reqd. number be x.

Ac. to Q.

$$\left(x - \frac{1}{2}\right) \times \frac{1}{2} = \frac{1}{8}$$

$$\Rightarrow \left(\frac{2x - 1}{2}\right) \times \frac{1}{2} = \frac{1}{8}$$

$$\Rightarrow \frac{2x - 1}{4} = \frac{1}{8} \quad \rightarrow \text{by CM}$$

$\Rightarrow 2x - 1 = \frac{4^{1}}{\cancel{8}2}$

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

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

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

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

$\Rightarrow x = \frac{3}{2 \times 2}$

$\Rightarrow x = 3/4$ ∴ The Reqd. no. is 3/4.

Q2:→ Perimeter of pool = 154m
Let breadth = x.
Then length = $2 + 2x$
Ac. to Q.
perimeter of pool = 154m
$2[l+b] = 154$
$\Rightarrow 2[2 + 2x + x] = 154$
$\Rightarrow 2[2 + 3x] = 154$
$\Rightarrow 2 + 3x = \frac{\cancel{154}^{77}}{\cancel{2}_{1}}$
$\Rightarrow 2 + 3x = 77$
$\Rightarrow 3x = 77 - 2$
$\Rightarrow 3x = 75$
$\Rightarrow x = \frac{\cancel{75}^{25}}{\cancel{3}_{1}}$
∴ Breadth = x = 25m
length = $[2 + 2x] = [2 + 50] = 52$m

Q4:→ Let the one number be x
Then, the other number = $x + 15$
Ac. to Q.
$x + (x + 15) = 95$
$x + x + 15 = 95$
$2x + 15 = 95$
$2x = 95 - 15$
$2x = 80$
$x = \frac{\cancel{80}^{40}}{\cancel{2}_{1}}$
$x = 40$
∴ Ist number = x
= 40
2nd number = $x + 15$
= 40 + 15
= 55

Q5:→ let the numbers be $5x$ and $3x$

Ac. to Q

$5x - 3x = 18$

$\Rightarrow 2x = 18$

$\Rightarrow x = \frac{18}{2_1}^{9}$

$\Rightarrow x = 9$

$\therefore$ Ist no. $= 5x$

$= 5 \times 9$

$= 45$

& 2nd no. $= 3x$

$= 3 \times 9$

$= 27$

Q6:→ let the three consecutive numbers be x, $(x+1)$ and $(x+2)$

Ac. to Q

$x + (x+1) + (x+2) = 51$

$x + x + 1 + x + 2 = 51$

$3x + 3 = 51$

$3x = 51 - 3$

$3x = 48$

$x = \frac{48}{3_1}^{16}$

$x = 16.$

$\therefore$ three integers are

$x = 16$

$x+1 = 16+1 = 17$

$x+2 = 16+2 = 18$

Q9:→ let the ages of Sahil and Anwar be $5x$ and $7x$ resp.

Four years later

Age of Sahil $= 5x+4$

Age of Anwar $= 7x+4$

Ac. to Q

$(5x+4) + (7x+4) = 56$

$\Rightarrow 5x + 4 + 7x + 4 = 56$

$\Rightarrow 12x + 8 = 56$

$\Rightarrow 12x = 56 - 8$

$\Rightarrow 12x = 48$

$\Rightarrow x = \frac{48}{12_1}^{4}$

$\Rightarrow x = 4$

Q10:→ let the number of boys and girls be $7x$ & $5x$ resp.

Ac. to Q.

$7x - 5x = 8$

$\Rightarrow 2x = 8$

$\Rightarrow x = \frac{8}{2_1}^{4}$

$\Rightarrow x = 4$

$\therefore$ No. of boys $= 7x$

$= 7 \times 4$

$= 28$

∴ Present age of Sahil = 5x
= 5(4)
= 20 years

& Present age of Anwar = 7x
= 7(4)
= 28 years

and No. of girls = 5x
= 5(4)
= 20

∴ Total Strength of class
= 28 + 20
= 48.

Q13):→ let the rational number be x.

Ac. to Q

$$\left(\frac{5}{2} \times x\right) + \frac{2}{3} = -\frac{7}{12}$$

$$\Rightarrow \frac{5x}{2} + \frac{2}{3} = -\frac{7}{12}$$

$$\Rightarrow \frac{5x}{2} = -\frac{7}{12} - \frac{2}{3}$$

$$\Rightarrow \frac{5x}{2} = \frac{(-7 \times 1) - (2 \times 4)}{12}$$

$$\Rightarrow \frac{5x}{2} = \frac{-7-8}{12}$$

$$\Rightarrow \frac{5x}{2} = -\frac{15}{12}$$

$$\Rightarrow x = -\frac{\cancel{15}^{3}}{\cancel{12}_{6}} \times \frac{\cancel{2}^{1}}{\cancel{5}_{1}}$$

$$\Rightarrow x = -\frac{\cancel{3}^{1}}{\cancel{6}_{2}}$$

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

∴ The reqd. rational no. is $-1/2$.

Q14):→ let the Maryam has notes of ₹100, ₹50 and ₹10 as 2x, 3x and 5x resp.

Ac. to Q.

$$(2x \times 100) + (3x \times 50) + (5x \times 10) = 400000$$

$$\Rightarrow 200x + 150x + 50x = 400000$$

$$\Rightarrow 400x = 400000$$

$$\Rightarrow x = \frac{\cancel{400000}^{1000}}{\cancel{400}_{1}}$$

$$\Rightarrow x = 1000$$

∴ Hence, Maryam has ₹100 notes
= 2x
= 2 × 1000
= 2000.

₹50 notes = 3x
= 3 × 1000
= 3000.

& ₹10 notes = 5x
= 5 × 1000
= 5000.

Exercise No : 2.3

Solve the following equations and check your results:

1) :→ $3x = 2x + 18$

Sol :→ $3x = 2x + 18$

$\Rightarrow 3x - 2x = 18$

$\Rightarrow x = 18$.

Check : $3x = 2x + 18$

$\Rightarrow 3(18) = 2(18) + 18$

$\Rightarrow 54 = 36 + 18$

$= 54$.

4) :→ $4z + 3 = 6 + 2z$

Sol :→ $4z + 3 = 6 + 2z$

$\Rightarrow 4z - 2z = 6 - 3$

$\Rightarrow 2z = 3$

$\Rightarrow z = 3/2$.

Check : $4z + 3 = 6 + 2z$

$\Rightarrow \frac{\cancel{4}^{2} \times 3}{\cancel{2}_{1}} + 3 = 6 + \frac{\cancel{2} \times 3}{\cancel{2}}$

$\Rightarrow 6 + 3 = 6 + 3$

$\Rightarrow 9 = 9$.

5) :→ $2x - 1 = 14 - x$

Sol :→ $2x - 1 = 14 - x$

$\Rightarrow 2x + x = 14 + 1$

$\Rightarrow 3x = 15$

$\Rightarrow x = \frac{\cancel{15}^{5}}{\cancel{3}_{1}}$

$\Rightarrow x = 5$

Check : $2x - 1 = 14 - x$

$\Rightarrow 2(5) - 1 = 14 - 5$

$\Rightarrow 10 - 1 = 9$

$\Rightarrow 9 = 9$.

3) :→ $5x + 9 = 5 + 3x$

Sol :→ $5x + 9 = 5 + 3x$

$\Rightarrow 5x - 3x = 5 - 9$

$\Rightarrow 2x = -4$

$\Rightarrow x = \frac{-\cancel{4}^{2}}{\cancel{2}_{1}}$

$\Rightarrow x = -2$

Check : $5x + 9 = 5 + 3x$

$\Rightarrow 5(-2) + 9 = 5 + 3(-2)$

$\Rightarrow -10 + 9 = 5 - 6$

$\Rightarrow -1 = -1$

7) :→ $x = \frac{4}{5}(x + 10)$

Sol :→ $x = \frac{4}{5}(x + 10)$

$\Rightarrow 5x = 4(x + 10)$

$\Rightarrow 5x = 4x + 4(10)$

$\Rightarrow 5x = 4x + 40$

$\Rightarrow 5x - 4x = 40$

$\Rightarrow x = 40$.

Check : $x = \frac{4}{5}(x + 10)$

$\Rightarrow 40 = \frac{4}{5}(40 + 10)$

$= \frac{4}{\cancel{5}_{1}} \times \cancel{50}^{10}$

$= 40$.

9) $2y + \frac{5}{3} = \frac{26}{3} - y$

Sol:→ $2y + \frac{5}{3} = \frac{26}{3} - y$

$\Rightarrow 2y + y = \frac{26}{3} - \frac{5}{3}$

$\Rightarrow 3y = \frac{26-5}{3} = \frac{21}{3_1}$ (7)

$\Rightarrow 3y = 7$

$\Rightarrow y = 7/3$

check: $2y + \frac{5}{3} = \frac{26}{3} - y$

$\Rightarrow \frac{2\times 7}{3} + \frac{5}{3} = \frac{26}{3} - \frac{7}{3}$

$\Rightarrow \frac{14}{3} + \frac{5}{3} = \frac{26}{3} - \frac{7}{3}$

$= \frac{14+5}{3} = \frac{26-7}{3}$

$= \frac{19}{3} = \frac{19}{3}$

10) $3m = 5m - \frac{8}{5}$

Sol:→ $3m = 5m - \frac{8}{5}$

$\Rightarrow 3m - 5m = -\frac{8}{5}$

$\Rightarrow -2m = -\frac{8}{5}$

$\Rightarrow m = \frac{-8^{4}}{5x-2_1}$

$\Rightarrow m = 4/5$

check: $3m = 5m - \frac{8}{5}$

$\Rightarrow \frac{3\times 4}{5} = \frac{5\times 4}{5} - \frac{8}{5}$

$\Rightarrow \frac{12}{5} = \frac{20}{5} - \frac{8}{5}$

$\Rightarrow \frac{12}{5} = \frac{20-8}{5} = \frac{12}{5}$

Exercise No: 2.4

Note:→ Questions on Book on page no. 32

Q1:→ let the regd. number be x

Ac. to Q

$\left(x - \frac{5}{2}\right) \times 8 = 3x$

$\Rightarrow \left(\frac{2x-5}{2_1}\right) \times 8^{4} = 3x$

$\Rightarrow 4(2x-5) = 3x$

$\Rightarrow 4(2x) - 4(5) = 3x$

$\Rightarrow 8x - 20 = 3x$

$\Rightarrow 8x - 3x = 20$

$\Rightarrow 5x = 20$

$\Rightarrow x = \frac{\cancel{20}^{4}}{\cancel{5}_{1}}$

$\Rightarrow x = 4$ ∴ the reqd. number is 4.

Q3:→ let the unit's digit be x

the sum of the digits of the number is 9

then, the tens digit must be (9-x).

Ac. to Q

$(9-x) \times 10 + x$

$\Rightarrow 90 - 10x + x$

$\Rightarrow 90 - 9x$

On interchanging the digits the units digit becomes (9-x) and tens digit becomes x.

thus, the new number is expressed as

$x \times 10 + (9-x) \Rightarrow 10x + 9 - x \Rightarrow 9x + 9$

further Ac. to Q.

$(9x+9) - (90-9x) = 27$

$\Rightarrow 9x + 9 - 90 + 9x = 27$

$\Rightarrow 18x - 81 = 27$

$\Rightarrow 18x = 27 + 81$

$\Rightarrow 18x = 108$

$\Rightarrow x = \frac{\cancel{108}^{6}}{\cancel{18}_{1}}$

thus units digit is 6

tens digit = $9-x \Rightarrow 9-6 \Rightarrow 3$

∴ the reqd. two digit number is 36.

Q5:→ let Sahil's present age be x.

then Sahil's mother's present age be 6x.

After five years Sahil's age be = (x+5) years

Ac. to Q

$$x+5 = \frac{1}{\cancel{3}_1}(\overset{2}{\cancel{6}}x)$$

$\Rightarrow \quad x+5 = 2x$

$\Rightarrow \quad x-2x = -5$

$\Rightarrow \quad -x = -5$

$\Rightarrow \quad x = 5$

$\therefore$ Sahil's present age $= x = 5$ years.

Mother's present age $= 6x = 6(5) = 30$ years

Q8:⇒ let the number of deer in the herd be x.

Number of deer grazing in the field $= \frac{1}{2}$ of $x = \frac{x}{2}$

$\therefore$ Rest number of deer $= x - \frac{x}{2} = \frac{2x-x}{2} = \frac{x}{2}$

Three fourth of the remaining are playing $= \frac{3}{4}$ of $\frac{x}{2}$

$= \frac{3}{4} \times \frac{x}{2} = \frac{3x}{8}$

$\therefore$ Rest of deer $= \frac{x}{2} - \frac{3x}{8}$

$\Rightarrow \quad 9 = \frac{4x-3x}{8}$ — by CM

$\Rightarrow \quad 9 \times 8 = 4x - 3x$

$\Rightarrow \quad 72 = x.$

Thus, the number of deer in herd is 72.

Q10:⇒ let Suhail's Son's present age be x.

Then, Suhail's present age be $3x$.

Ten years ago Son's age $= (x-10)$ years

Suhail's age $= (3x-10)$ years.

Ac. to Q

$(3x-10) = 5(x-10)$.

$\Rightarrow 3x - 10 = 5x - 5(10)$

$\Rightarrow 3x - 10 = 5x - 50$

$\Rightarrow 3x - 5x = -50 + 10$

$\Rightarrow -2x = -40$

$\Rightarrow x = \frac{-40}{-2_1}$ 20

$\Rightarrow x = 20.$

$\therefore$ Son's present age $= x = 20$ years.
Suhail's present age $= 3x = 3(20) = 60$ years.

[Note: Solve & practice remaining questions by your-self].

Exercise No: 2.5

Solve the following linear equations:

1) $\frac{x}{2} - \frac{1}{5} = \frac{x}{3} + \frac{1}{4}$

Sol:- $\frac{x}{2} - \frac{1}{5} = \frac{x}{3} + \frac{1}{4}$

$\Rightarrow \frac{x}{2} - \frac{x}{3} = \frac{1}{4} + \frac{1}{5}$

$\Rightarrow \frac{3x - 2x}{6} = \frac{5+4}{20}$

$\Rightarrow \frac{x}{6} = \frac{9}{20}$ -by CM

$\Rightarrow x = \frac{9 \times 6^3}{20_{10}}$

$\Rightarrow x = \frac{9 \times 3}{10}$

$\Rightarrow x = \frac{27}{10}.$

3) $x + 7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$

Sol:- $x + 7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$

$\Rightarrow \frac{x}{1} - \frac{8x}{3} + \frac{5x}{2} = \frac{17}{6} - \frac{7}{1}$

$\Rightarrow \frac{6x - 16x + 15x}{6} = \frac{17 - 42}{6}$

$\Rightarrow \frac{6x - x}{6} = -\frac{25}{6}$

$\Rightarrow \frac{5x}{6} = -\frac{25}{6}$

$\Rightarrow x = -\frac{25}{6_1} \times \frac{6^1}{5_1}$

$\Rightarrow x = -5$

4):→ $\frac{x-5}{3} = \frac{x-3}{5}$

Sol:→ $\frac{x-5}{3} = \frac{x-3}{5}$

$\Rightarrow 5(x-5) = 3(x-3)$

$\Rightarrow 5x - 5(5) = 3x - 3(3)$

$\Rightarrow 5x - 25 = 3x - 9$

$\Rightarrow 5x - 3x = -9 + 25$

$\Rightarrow 2x = 16$

$\Rightarrow x = \frac{16^{8}}{2_{1}}$

$\Rightarrow x = 8$

6):→ $m - \left(\frac{m-1}{2}\right) = 1 - \left(\frac{m-2}{3}\right)$

Sol:→ $\frac{m}{1} - \left(\frac{m-1}{2}\right) = \frac{1}{1} - \left(\frac{m-2}{3}\right)$

$\Rightarrow \frac{2m-(m-1)}{2} = \frac{3-(m-2)}{3}$

$\Rightarrow \frac{2m-m+1}{2} = \frac{3-m+2}{3}$

$\Rightarrow \frac{m+1}{2} = \frac{5-m}{3}$ -by cm

$\Rightarrow 3(m+1) = 2(5-m)$

$\Rightarrow 3m+3 = 10-2m$

$\Rightarrow 3m+2m = 10-3$

$\Rightarrow 5m = 7$

$\Rightarrow m = 7/5$

Simplify and Solve the following linear equations:

7):→ $3(t-3) = 5(2t+1)$

Sol:→ $3(t-3) = 5(2t+1)$

$\Rightarrow 3t - 3(3) = 5(2t) + 5(1)$

$\Rightarrow 3t - 9 = 10t + 5$

$\Rightarrow 3t - 10t = 5 + 9$

$\Rightarrow -7t = 14$

$\Rightarrow t = \frac{14^{2}}{-7_{1}}$

$\Rightarrow t = -2$

9):→ $3(5z-7) - 2(9z-11) = 4(8z-13) - 17$

Sol:→ $3(5z-7) - 2(9z-11) = 4(8z-13) - 17$

$\Rightarrow 3(5z) - 3(7) - 2(9z) + 2(11) = 4(8z) - 4(13) - 17$

$\Rightarrow 15z - 21 - 18z + 22 = 32z - 52 - 17$

$\Rightarrow -3z + 1 = 32z - 69$

$\Rightarrow -3z - 32z = -69 - 1$

$\Rightarrow -35z = -70$

$\Rightarrow z = +\frac{70^{14}\ 2}{+35_{7_{1}}}$

$\Rightarrow z = 2$

[Note: Solve & practice remaining parts by yourself]

Exercise No: 2.6

Solve the following equations:

1):→ $\frac{8x-3}{3x} = 2$

Sol:→ $\frac{8x-3}{3x} = 2$ — by cm

$\Rightarrow 8x - 3 = 2(3x)$

$\Rightarrow 8x - 3 = 6x$

$\Rightarrow 8x - 6x = 3$

$\Rightarrow 2x = 3$

$\Rightarrow x = \frac{3}{2}$.

2):→ $\frac{9x}{7-6x} = 15$

Sol:→ $\frac{9x}{7-6x} = 15$ → by cm

$\Rightarrow 9x = 15(7-6x)$

$\Rightarrow 9x = 15(7) - 15(6x)$

$\Rightarrow 9x = 105 - 90x$

$\Rightarrow 9x + 90x = 105$

$\Rightarrow 99x = 105$

$\Rightarrow x = \frac{105}{99}$ (35 / 33)

$\Rightarrow x = \frac{35}{33}$

3):→ $\frac{z}{z+15} = \frac{4}{9}$

Sol:→ $\frac{z}{z+15} = \frac{4}{9}$

$\Rightarrow 9z = 4(z+15)$

$\Rightarrow 9z = 4z + 4(15)$

$\Rightarrow 9z = 4z + 60$

$\Rightarrow 9z - 4z = 60$

$\Rightarrow 5z = 60$

$\Rightarrow z = \frac{60}{5}$ (12 / 1)

$\Rightarrow z = 12$

4):→ $\frac{3y+4}{2-6y} = \frac{-2}{5}$

Sol:→ $\frac{3y+4}{2-6y} = -\frac{2}{5}$

$\Rightarrow 5(3y+4) = -2(2-6y)$

$\Rightarrow 5(3y) + 5(4) = -2(2) + 2(6y)$

$\Rightarrow 15y + 20 = -4 + 12y$

$\Rightarrow 15y - 12y = -4 - 20$

$\Rightarrow 3y = -24$

$\Rightarrow y = \frac{-24}{3}$ (8 / 1)

$\Rightarrow y = -8$

5):⇒ $\frac{7y+4}{y+2} = -\frac{4}{3}$

Sol:⇒ $\frac{7y+4}{y+2} = -\frac{4}{3}$

⇒ $3(7y+4) = -4(y+2)$ — by cm

⇒ $3(7y) + 3(4) = -4y - 4(2)$

⇒ $21y + 12 = -4y - 8$

⇒ $21y + 4y = -8 - 12$

⇒ $25y = -20$

⇒ $y = -\frac{20}{25}^{4}_{5}$

⇒ $y = -\frac{4}{5}$

Q6):⇒ let the present ages of Aatif and Asif be $5x$ and $7x$ resp.

Four years later

Age of Aatif $= 5x+4$

Age of Asif $= 7x+4$

Ac. to Q.

⇒ $\frac{5x+4}{7x+4} = \frac{3}{4}$

⇒ $4(5x+4) = 3(7x+4)$ — by cm

⇒ $4(5x) + 4(4) = 3(7x) + 3(4)$

⇒ $20x + 16 = 21x + 12$

⇒ $20x - 21x = 12 - 16$

⇒ $-x = -4$

⇒ $x = 4$

∴ present age of Aatif $= 5x = 5(4) = 20$ years

present age of Asif $= 7x = 7(4) = 28$ years.

7) ⇒ let the numerator be x.

Then the denominator be $= x+8$

Again numerator is increased by 17 and denominator is decreased by 1.

Now, New numerator $= x+17$

New denominator $= x+8-1 = x+7$

∴ New rational number $= \frac{x+17}{x+7}$

Ac. to Q

Now, $\frac{x+17}{x+7} = \frac{3}{2}$

$\Rightarrow 2(x+17) = 3(x+7)$ — by cm

$\Rightarrow 2x+34 = 3x+21$

$\Rightarrow 2x-3x = 21-34$

$\Rightarrow +x = +13$

$\Rightarrow x = 13.$

∴ Numerator $= 13$

denominator $= x+8 = 13+8 = 21.$

∴ the reqd. rational number is $\frac{13}{21}$.