

NEW-ERA PUBLIC SCHOOL

CLASS : 7th

SUBJECT : MATHEMATICS

SESSION : 2021

SOLVED ASSIGNMENT OF UNIT : II

LESSON No : 2.1

CHAPTER : FRACTIONS AND DECIMALS

Ex : 2.1

Q1: Identify proper fraction, improper fraction & mixed fraction

Sol:- proper fraction:- $\frac{3}{13}$, $\frac{1}{8}$, $\frac{15}{22}$, $\frac{17}{30}$ Improper fraction:- $\frac{12}{5}$, $\frac{4}{3}$, $\frac{11}{8}$, $\frac{45}{20}$ Mixed fraction:- $1\frac{1}{3}$, $2\frac{5}{9}$, $5\frac{3}{4}$.

Q7:- Simplify

a) $\frac{1}{3} + \frac{2}{7}$

Sol:- $\frac{1}{3} + \frac{2}{7}$

$$\Rightarrow \frac{(1 \times 7) + (2 \times 3)}{3 \times 7}$$

$$\Rightarrow \frac{7+6}{21} \Rightarrow \frac{13}{21}$$

d) $\frac{9}{10} - \frac{2}{5}$

Sol:- $\frac{(9 \times 1) - (2 \times 2)}{10}$

$$\Rightarrow \frac{9-4}{10}$$

$$\Rightarrow \frac{5}{10} = \frac{1}{2}$$

Ex: 2.2

Q1: find the product:

a) $3 \times \frac{2}{3}$

Sol:- $3 \times \frac{2}{3} \Rightarrow 2$

i) $3 \times 5\frac{1}{5}$

Sol:- $3 \times \frac{26}{5} \Rightarrow \frac{78}{5}$

Q2:- find

a) $\frac{1}{2}$ of $10\frac{5}{5}$

Sol: $\frac{1}{2} \times 10 = 5$

c) $2\frac{1}{4} \times 7$

Sol:- $\frac{9}{4} \times \frac{7}{1} = \frac{63}{4}$

(2)

Ex: 2.3

Q1:- find the product:

a) $\frac{1}{2} \times \frac{1}{3}$

sol:- $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$

Q2:-
e) $1\frac{1}{4} \times 2\frac{1}{2}$

sol:- $\frac{5}{4} \times \frac{5}{2}$

$\Rightarrow \frac{25}{8}$

g) $\frac{1}{5} \times \frac{2}{3} \times \frac{1}{8}$

sol:- $\frac{1}{5} \times \frac{2}{3} \times \frac{1}{8} = \frac{1}{60}$

j) $1\frac{3}{4} \times 2\frac{3}{5}$

sol:- $\frac{7}{4} \times \frac{13}{5}$

$= \frac{91}{20}$

Ex: 2.4

Q2:- find

a) $6 \div \frac{1}{3}$

sol:- $6 \times \frac{3}{1}$

$\Rightarrow 18$

g) $14 \div \frac{7}{8}$

sol:- $14 \times \frac{8}{7}$

$\Rightarrow 16$

h) $10 \div \frac{8}{5}$

sol:- $10 \times \frac{5}{8}$

$\Rightarrow \frac{25}{4}$

Q3: find

a) $17 \div 2\frac{3}{7}$

sol:- $17 \div \frac{17}{7}$

$\Rightarrow 17 \times \frac{7}{17}$

$\Rightarrow 7$

h) $2\frac{1}{5} \div 3$

sol:- $\frac{11}{5} \div \frac{3}{1}$

$\Rightarrow \frac{11}{5} \times \frac{1}{3} = \frac{11}{15}$

Ex: 2.5

Q1: Simplify:

$6 \times 2 - \frac{1}{4} \times \frac{1}{4} \div 4$

sol:- $6 \times 2 - \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}$

$\Rightarrow \frac{12}{1} - \frac{1}{64}$

$\Rightarrow \frac{(12 \times 64) - (1 \times 1)}{64}$

$\Rightarrow \frac{768-1}{64} \Rightarrow \frac{767}{64}$

Ex: 2.6

Ex: 2.7

$$\Rightarrow 20.084$$
$$= 8.70$$
$$\Rightarrow 0.0050$$

(4)

Ex: 2.8

Q1: Find the Quotient:

a) $25.5 \div 10$

sol) $\overline{25.5} \div 10$
 $\Rightarrow 2.55$

f) $6.1 \div 100$

sol) $\overline{6.1} \div 100$
 $\Rightarrow 0.061$

d) $11.86 \div 100$

sol) $\overline{11.86} \div 100$
 $\Rightarrow 0.1186$

i) $248.8 \div 100$

sol) $\overline{248.8} \div 100$
 $\Rightarrow 2.488$

While dividing a number by 10, 100, 1000 shift the decimal towards left

Q2:- Find the Quotient:

a) $0.9 \div 3$

sol) $\begin{array}{r} 3 \\ 9 \\ \hline \end{array}$ — RD
 $\Rightarrow 0.3$

c) $0.125 \div 5$

sol) $\begin{array}{r} 25 \\ 125 \\ \hline \end{array}$ 25
 $\Rightarrow 0.025$

→ Same method as in multiplication

e) $0.07 \div 7$

sol) $\begin{array}{r} 1 \\ 7 \\ \hline \end{array}$ — RD
 $\Rightarrow 0.01$

d) $3.12 \div 8$

sol) $\begin{array}{r} 39 \\ 312 \\ \hline \end{array}$ 39
 $= 0.39$

→ RD

NOTE: Ex: 2.9, Ex: 2.10, Ex: 2.11 deleted

NOTE: Fractions are the same as rational numbers.

As we add, subtract, multiply, divide rational numbers the fractions are also done by the same method. [Solve remaining parts of questions by yourself.]

LESSON NO: 13CHAPTER: Exponents & Powers

Note: ~~Remembering~~ Parts

Ex: 13.1 are already done in class

Ex: 13.2

Q1: Verify each of the following:

a) $2^4 \times 2^5 = 2^{4+5} = 2^9$

Sol: Taking LHS

$\Rightarrow 2^4 \times 2^5$

$\Rightarrow (2)^{4+5}$

$\Rightarrow (2)^9$

$\Rightarrow \text{LHS} = \text{RHS}$

e) $(2^6)^3 = (2)^{6 \times 3} = (2)^{18}$

Sol: Taking LHS

$\Rightarrow (2^6)^3$

$\Rightarrow (2)^{6 \times 3}$

$\Rightarrow (2)^{18}$

$\Rightarrow \text{LHS} = \text{RHS}$

Q2:- Determine The value of p , if:

a) $(-4)^7 \times (-4)^3 = (-4)^{5p}$

Sol:- $(-4)^7 \times (-4)^3 = (-4)^{5p}$

$\Rightarrow (-4)^{7+3} = (-4)^{5p}$

$\Rightarrow (-4)^{10} = (-4)^{5p}$

Comparing the powers we get.

$\Rightarrow 10 = 5p$

or $5p = 10$

$\Rightarrow p = \frac{10}{5} = 2$

$\Rightarrow p = 2$

c) $\left(\frac{2}{9}\right)^7 \div \left(\frac{2}{9}\right)^7 = \left(\frac{2}{9}\right)^p$

Sol: $\left(\frac{2}{9}\right)^7 \div \left(\frac{2}{9}\right)^7 = \left(\frac{2}{9}\right)^p$

$\Rightarrow \left(\frac{2}{9}\right)^{7-7} = \left(\frac{2}{9}\right)^p$

$\Rightarrow \left(\frac{2}{9}\right)^0 = \left(\frac{2}{9}\right)^p$

$\rightarrow$ Bases are same powers are added in case of multiplication.

$\rightarrow$ In case of division when bases are same powers are subtracted.

Comparing the powers we get
 $p = 0$.

Q3: Express each of the following as a single exponent:

a) $(2^3)^6 \times (2^4)^3$

Sol:- $(2^3)^6 \times (2^4)^3$
 $\Rightarrow (2)^{3 \times 6} \times (2)^{4 \times 3}$
 $\Rightarrow (2)^{18} \times (2)^{12}$
 $\Rightarrow (2)^{18+12}$
 $\Rightarrow (2)^{30}$

e) $\left(\frac{1}{5}\right)^2 \times \left[\left(\frac{1}{5}\right)^3\right]^0$

Sol:- $\left(\frac{1}{5}\right)^2 \times \left[\left(\frac{1}{5}\right)^3\right]^0$
 $\Rightarrow \left(\frac{1}{5}\right)^2 \times \left(\frac{1}{5}\right)^{3 \times 0}$
 $\Rightarrow \left(\frac{1}{5}\right)^2 \times \left(\frac{1}{5}\right)^0$
 $\Rightarrow \left(\frac{1}{5}\right)^{2+0}$
 $\Rightarrow \left(\frac{1}{5}\right)^2$

Q4:- Express each of the following as a single exponent:

a)

$(a^5 \div a^3) \times a^8$

Sol:- $(a^5 \div a^3) \times a^8$
 $\Rightarrow (a)^{5-3} \times a^8$
 $\Rightarrow (a)^2 \times (a)^8$
 $\Rightarrow$

c) $(3^4)^5 \times (3^2)^3$

Sol:- $(3^4)^5 \times (3^2)^3$
 $\Rightarrow (3)^{4 \times 5} \times (3)^{2 \times 3}$
 $\Rightarrow (3)^{20} \times (3)^6$
 $\Rightarrow (3)^{20+6}$
 $\Rightarrow (3)^{26}$

f) $[(5)^3 \times 5^4] \div 5^7$

Sol:- $[(5)^3 \times (5)^4] \div (5)^7$
 $\Rightarrow [(5)^{2 \times 3} \times (5)^4] \div (5)^7$
 $\Rightarrow [(5)^6 \times (5)^4] \div (5)^7$
 $\Rightarrow [(5)^{6+4}] \div (5)^7$
 $\Rightarrow (5)^{10} \div (5)^7$
 $\Rightarrow (5)^{10-7}$
 $\Rightarrow (5)^3$

c)

$\frac{a^3 \times b^2}{b^3 \times a^2}$

Sol:- $\frac{a^3 \times b^2}{b^3 \times a^2}$
 $\Rightarrow (a)^{3-2} \times (b)^{2-3}$

$$\Rightarrow (a)^{2+8}$$

$$\Rightarrow (a)^{10}$$

Q5:- Check, whether the following statements are true or false:

a) $100 \times 10^6 = 10^7$
 Sol:- $100 \times 10^6 = 10^7$
 $\Rightarrow (10)^2 \times 10^6 = 10^7$
 $\Rightarrow (10)^{2+6} = 10^7$
 $\Rightarrow (10)^8 \neq 10^7$

false

d) $3^0 = (1000)^0$
 Sol:- $(3)^0 = (1000)^0$
 $\Rightarrow 1 = 1$
 $\Rightarrow \text{True}$

Q6:- Express each of the following as a product of prime factors only in exponential form:

a) 25×1372

Sol:-

5	25
5	5
	1

2	1372
2	686
7	343
7	49
7	7
	1

$$\Rightarrow 2 \times 2 \times 5 \times 5 \times 7 \times 7 \times 7$$

$$\Rightarrow (2)^2 \times (5)^2 \times (7)^3$$

b) 729×64

Sol:- 729×64

$$\Rightarrow (a)^1 \times (b)^{-1}$$

$$\Rightarrow \frac{a}{b}$$

b) $10 \times 10^{11} = 10^{10}$
 Sol:- $10^1 \times 10^{11} = 10^{10}$
 $\Rightarrow (10)^{1+11} = 10^{10}$
 $\Rightarrow (10)^{12} \neq 10^{10}$
 false.

e) $1000 \div 10^8 = 10^{-5}$
 Sol:- $1000 \div 10^8 = 10^{-5}$
 $\Rightarrow (10)^3 \div (10)^8 = 10^{-5}$
 $\Rightarrow (10)^{3-8} = 10^{-5}$
 $\Rightarrow (10)^{-5} = 10^{-5}$
 True

$$\begin{array}{r|l}
 3 & 729 \\
 \hline
 3 & 243 \\
 \hline
 3 & 81 \\
 \hline
 3 & 27 \\
 \hline
 3 & 9 \\
 \hline
 3 & 3 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 64 \\
 \hline
 2 & 32 \\
 \hline
 2 & 16 \\
 \hline
 2 & 8 \\
 \hline
 2 & 4 \\
 \hline
 2 & 2 \\
 \hline
 & 1
 \end{array}$$

$$\Rightarrow 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$\Rightarrow (3)^6 \times (2)^6$$

$$\text{or } (3 \times 2)^6$$

$$\Rightarrow (6)^6$$

→ Bases can be multiplied when powers are same.

Q7:- Simplify:

a) $(3^4 \times 3^5) \div 3^9$

Sol:- $(3^4 \times 3^5) \div 3^9$

$$\Rightarrow (3)^{4+5} \div 3^9$$

$$\Rightarrow (3)^9 \div (3)^9$$

$$\Rightarrow (3)^{9-9}$$

$$\Rightarrow (3)^0$$

$$\Rightarrow 1$$

c) $\left[\left(\frac{1}{2} \right)^3 \times \left(\frac{1}{2} \right)^4 \right]^5 \div \left(\frac{1}{8} \right)^3$

Sol: $\left[\left(\frac{1}{2} \right)^3 \times \left(\frac{1}{2} \right)^4 \right]^5 \div \left(\frac{1}{8} \right)^3$

$$\Rightarrow \left[\left(\frac{1}{2} \right)^{3+4} \right]^5 \div \left(\frac{1}{2 \times 2 \times 2} \right)^3$$

$$\Rightarrow \left[\left(\frac{1}{2} \right)^7 \right]^5 \div \left[\left(\frac{1}{2} \right)^3 \right]^3$$

c) $\left[\left(-\frac{2}{3} \right)^3 \times \left(-\frac{2}{3} \right)^0 \right] \div \left(\frac{4}{9} \right)^1$

Sol:- $\left[\left(-\frac{2}{3} \right)^3 \times \left(-\frac{2}{3} \right)^0 \right] \div \left(\frac{4}{9} \right)^1$

$$\Rightarrow \left[\left(-\frac{2}{3} \right)^{3+0} \right] \div \frac{2 \times 2}{3 \times 3}$$

$$\Rightarrow \left(-\frac{2}{3} \right)^3 \div \left(-\frac{2}{3} \right)^2$$

$$\Rightarrow \left(-\frac{2}{3} \right)^{3-2}$$

$$\Rightarrow \left(-\frac{2}{3} \right)^1 \Rightarrow -\frac{2}{3}$$

g) $\frac{(2^5)^2 \times 7^3}{8^3 \times 7}$

Sol:- $\frac{(2^5)^2 \times 7^3}{8^3 \times 7}$

$$\Rightarrow \frac{(2)^{5 \times 2} \times 7^3}{(2 \times 2 \times 2)^3 \times 7}$$

$$\Rightarrow \frac{(2)^{10} \times (7)^3}{(2^3)^3 \times 7}$$

(9)

$$\Rightarrow \left(\frac{1}{2}\right)^{7 \times 5} \div \left(\frac{1}{2}\right)^{3 \times 3}$$

$$\Rightarrow \left(\frac{1}{2}\right)^{35} \div \left(\frac{1}{2}\right)^9$$

$$\Rightarrow \left(\frac{1}{2}\right)^{35-9}$$

$$\Rightarrow \left(\frac{1}{2}\right)^{26}$$

$$\Rightarrow \frac{(2)^{10} \times (7)^3}{(2)^{3 \times 3} \times 7}$$

$$\Rightarrow \frac{(2)^{10} \times (7)^3}{(2)^9 \times 7^1}$$

$$\Rightarrow (2)^{10-9} \times (7)^{3-1}$$

$$\Rightarrow (2)^1 \times (7)^2$$

$$\Rightarrow 2 \times 7 \times 7$$

$$\Rightarrow 2 \times 49 = 98$$

Q8:- If $5^{2x+1} \div 25 = 125$, find the value of x .

Sol: $5^{2x+1} \div 25 = 125$

$$\Rightarrow 5^{2x+1} \div 5 \times 5 = 5 \times 5 \times 5$$

$$\Rightarrow 5^{2x+1} \div (5)^2 = (5)^3$$

$$\Rightarrow (5)^{2x+1-2} = (5)^3$$

$$\Rightarrow (5)^{2x-1} = (5)^3$$

Comparing the powers we get.

$$2x-1 = 3$$

$$\Rightarrow 2x = 3+1$$

$$\Rightarrow 2x = 4$$

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

$$\Rightarrow x = 2.$$

- find factors of 25 & 125

Note:- Do remaining part of ex: 13.2 by yourself.
4 practice all.

Ex: 13.3

Note: $\rightarrow$ Any number can be written as a number between 1 and 10 multiplied by a power of 10. Such a form of number is called standard form of the number.

Q1: $\rightarrow$ Which of the following are not in standard form:

a) 6.2×10^5

sol: it is in standard form

c) 6.0×10^5

sol: yes, it is

e) 72.6×10^6

sol: yes, it is

b) 7.348×10^{16}

sol: yes, it is

d) 0.26×10^7

sol: No, it is not

f) 6.75×10^1

sol: yes, it is

Q2: write the following in standard form:

a) 800000

sol: 800000

$\Rightarrow 8 \times 100000$

$\Rightarrow 8 \times 10^5$

b) 64000000

sol: 64000000

$\Rightarrow 64 \times 1000000$

$\Rightarrow 64 \times 10^6$

$\Rightarrow \frac{64}{10} \times 10^6 \times 10^1$

$\Rightarrow 6.4 \times 10^{6+1}$

$\Rightarrow 6.4 \times 10^7$

c) 485000000000

sol: 485000000000

$\Rightarrow 485 \times 1000000000$

$\Rightarrow 485 \times 10^9$

$\Rightarrow \frac{485}{100} \times 10^9 \times 100$

$\Rightarrow 4.85 \times 10^9 \times 10^2$

$\Rightarrow 4.85 \times 10^{9+2}$

$\Rightarrow 4.85 \times 10^{11}$

Q3: Rewrite the following in standard form:

a) 36×10^5

sol:- 36×10^5

$\Rightarrow 3780$

$\Rightarrow 378 \times 10$

$\Rightarrow \frac{378}{100} \times 10 \times 100$

$\Rightarrow 3.78 \times 10^1 \times 10^2$

$\Rightarrow 3.78 \times (10)^{1+2}$

$\Rightarrow \underline{3.78 \times 10^3}$

d) 0.75×10^8

sol:- 0.75×10^8

$\Rightarrow \frac{75}{100} \times 10^8$

$\Rightarrow \frac{75}{10 \times 10} \times 10^8$

$\Rightarrow \frac{7.5}{10} \times 10^8$

$\Rightarrow 7.5 \times (10)^{8-1}$

$\Rightarrow \underline{7.5 \times 10^7}$

Q4: Multiply the following & write the product in standard form:

a) 300×40000

sol:- 300×40000

$\Rightarrow 12000000$

$\Rightarrow 12 \times 1000000$

$\Rightarrow 12 \times 10^6$

$\Rightarrow \frac{12}{10} \times 10^6 \times 10$

c) 16×10^5

sol:- 16×10^5

$\Rightarrow \frac{16}{10} \times 10^5 \times 10^1$

$\Rightarrow 1.6 \times 10^{5+1}$

$\Rightarrow \underline{1.6 \times 10^6}$

e) 0.4×10^{10}

sol:- 0.4×10^{10}

$\Rightarrow \frac{4}{10} \times 10^{10}$

$\Rightarrow 4 \times (10)^{10-1}$

$\Rightarrow \underline{4 \times 10^9}$

f) 50×10^6

sol:- 50×10^6

$\Rightarrow 5 \times 10 \times 10^6$

$\Rightarrow 5 \times (10)^{1+6}$

$\Rightarrow \underline{5 \times 10^7}$

c) 4500×3000

sol:- 4500×3000

$\Rightarrow 13500000$

$\Rightarrow 135 \times 100000$

$\Rightarrow 135 \times 10^5$

$\Rightarrow \frac{135}{100} \times 10^5 \times 100$

(12)

$$\Rightarrow 1.2 \times 10^{6+1}$$

$$\Rightarrow 1.2 \times 10^7$$

$$1.35 \times 10^5 \times 10^2$$

$$1.35 \times (10)^{5+2}$$

$$1.35 \times 10^7$$

Q5 Light from the Sun takes app. 8 min to reach the Earth. If light travels at a speed of 3×10^8 m/sec, calculate the distance of the Sun from the Earth.

Sol:- we have

$$\text{Speed} = 3 \times 10^8 \text{ m/sec}$$

$$\text{Time} = 8 \text{ min}$$

$$= 8 \times 60 \text{ sec}$$

$$= 480 \text{ sec}$$

$$= 48 \times 10 \text{ sec}$$

$$= \frac{48}{10} \times 10 \times 10$$

$$= 4.8 \times 10^{1+1}$$

$$= 4.8 \times 10^2 \text{ sec.}$$

$$\therefore 1 \text{ min} = 60 \text{ sec.}$$

we know

$$\text{Speed} = \frac{\text{Distance covered}}{\text{Time Taken}}$$

$$\Rightarrow \text{Distance} = \text{Speed} \times \text{Time Taken}$$

$$= 3 \times 10^8 \frac{\text{m}}{\text{sec}} \times 4.8 \times 10^2 \text{ sec}$$

$$= 3 \times 4.8 \times 10^8 \times 10^2 \text{ m}$$

$$= 14.4 \times (10)^{8+2} \text{ m}$$

$$= 14.4 \times 10^{10} \text{ m}$$

$$= \frac{14.4}{10} \times 10^{10} \times 10^1 \text{ m}$$

$$= 1.44 \times (10)^{10+1} \text{ m}$$

$$= 1.44 \times 10^{11} \text{ m.}$$

Note :- Do remaining parts by yourself and Practice full exercise.

LESSON NO: 09

CHAPTER: RATIONAL NUMBERS

A number of the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$, is called a rational number.

Ex: 9.1

Q1: Which of the following rational numbers are positive and which are negative:

Sol:- positive rational numbers: $\frac{17}{20}$, $-\frac{11}{25}$, $-\frac{17}{85}$

Negative rational numbers: $\frac{3}{-7}$, $-\frac{6}{25}$, $-\frac{41}{32}$

Q2:- Write any three rational numbers, each equivalent to the following:

a) $-\frac{7}{3}$

Sol:- $-\frac{7}{3}$

$$\Rightarrow -\frac{7}{3} \times \frac{2}{2} = -\frac{14}{6}$$

$$\Rightarrow -\frac{7}{3} \times \frac{3}{3} = -\frac{21}{9}$$

$$\Rightarrow -\frac{7}{3} \times \frac{4}{4} = -\frac{28}{12}$$

c) $\frac{16}{-25}$

$$\text{Sol:- } \frac{16}{-25} \times \frac{2}{2} = \frac{32}{-50}$$

$$-\frac{16}{25} \times \frac{3}{3} = \frac{48}{-75}$$

$$\frac{16}{-25} \times \frac{4}{4} = \frac{64}{-100}$$

Q3:- Express each of the following rational numbers in standard form:

a) $-\frac{32}{40}$

$$\text{Sol:- } -\frac{\cancel{32}^4}{\cancel{40}_5} = -\frac{4}{5}$$

c) $\frac{18}{-42}$

$$\text{Sol:- } \frac{\cancel{18}^3}{-\cancel{42}_7} = \frac{3}{-7}$$

b) $-\frac{25}{50}$

$$\text{Sol:- } -\frac{\cancel{25}^5}{\cancel{50}_{10}^2} = -\frac{1}{2}$$

e) $\frac{130}{300}$

$$\text{Sol:- } \frac{\cancel{130}^1}{\cancel{300}_{30}} = \frac{13}{30}$$

Q4:- fill in the blanks:

a) $\frac{5}{\dots} = \frac{90}{216}$

sol:- $\frac{5}{x} = \frac{90}{216}$ - by cm

$$\Rightarrow 90x = 216 \times 5$$

$$\Rightarrow x = \frac{216 \times 5}{90} \quad 12$$

$$\Rightarrow x = \frac{1080}{90}$$

$$\Rightarrow x = 12$$

c) $\frac{9}{16} = \frac{90}{\dots}$

sol:- $\frac{9}{16} = \frac{90}{x}$ - by cm

$$\Rightarrow 9x = 90 \times 16$$

$$\Rightarrow 9x = 1440$$

$$\Rightarrow x = \frac{1440}{9} \quad 160$$

$$\Rightarrow x = 160$$

Q5: Express each of the following rational numbers with a positive denominator:

a) $\frac{2}{-3}$

sol:- $2/-3$

Multiply both numerator and denominator with -1

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

c) $\frac{-11}{-13}$

sol:- Multiply both num. and demo. with -1

$$\frac{-11}{-13} \times \frac{-1}{-1} = \frac{11}{13}$$

Q6:- Check, if following are equal:

a) $\frac{6}{-18}$, $-\frac{5}{15}$

sol:- $6 \times 15 = 90$

$$-18 \times -5 = 90$$

$$\Rightarrow \frac{6}{-18} = -\frac{5}{15}$$

c) $\frac{3}{-8}$, $-\frac{15}{40}$

sol:- $3 \times 40 = 120$

$$-8 \times -15 = 120$$

$$\Rightarrow \frac{3}{-8} = -\frac{15}{40}$$

Q7: find x such that the following pairs of rational numbers are equivalent:

a) $\frac{x}{12} = \frac{5}{6}$

Sol:- $\frac{x}{12} = \frac{5}{6}$ - by cm

$\Rightarrow 6x = 12 \times 5$

$\Rightarrow 6x = 60$

$\Rightarrow x = \frac{60}{6}$

$\Rightarrow x = 10$

c) $\frac{x}{6}, -13$

Sol:- $\frac{x}{6} = -\frac{13}{1}$

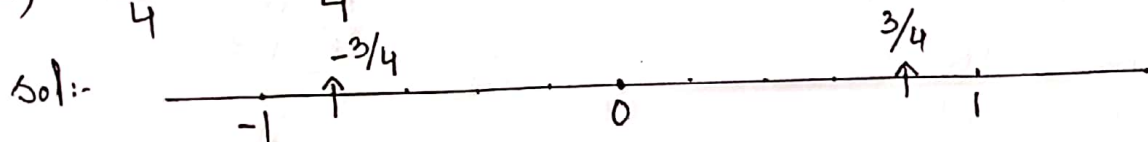
$\Rightarrow x = 6 \times -13$

$\Rightarrow x = -78$

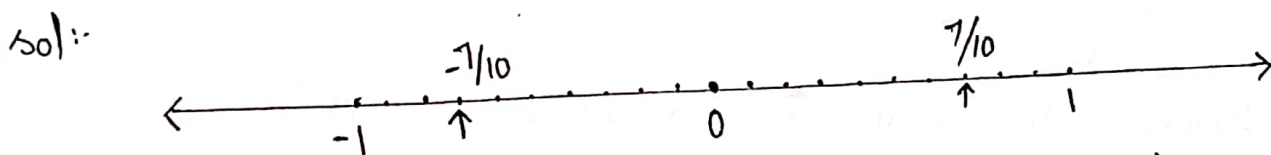
Ex : 9.2

Q1: Draw a number line and represent the following rational numbers:

a) $\frac{3}{4}$ & $-\frac{3}{4}$



c) $-\frac{7}{10}$ and $\frac{7}{10}$



Q4:- which of the two rational numbers are greater:

a) $-\frac{5}{8}, -\frac{2}{3}$

Sol:- $-\frac{5}{8} \times -\frac{2}{3}$

$\Rightarrow -5 \times 3 = -15$

$8 \times -2 = -16$

$\Rightarrow -15 > -16 \Rightarrow -\frac{5}{8}$ is greater

c) $-\frac{7}{10}, -\frac{5}{2}$

Sol:- $-\frac{7}{10} \times -\frac{5}{2}$

$\Rightarrow -7 \times 2 = -14$

$10 \times -5 = -50$

$\Rightarrow -14 > -50$

$\Rightarrow -\frac{7}{10}$ is greater

Q7:- Write the absolute value of :

a) $-\frac{7}{9}$

c) $-\frac{3}{-7}$

e) $-\frac{9}{20}$

f) $-\frac{9}{-11}$

sol:- $\frac{7}{9}$

sol:- $+\frac{3}{7}$

sol:- $\frac{9}{20}$

sol:- $\frac{9}{11}$

Q9: Which of the following pair represents the same rational number:

a) $\frac{1}{3}$ & $-\frac{1}{3}$

b) $-\frac{3}{5}$ & $-\frac{12}{20}$ ³/₅

c) $-\frac{1}{2}$ & $\frac{1}{4}$

sol:- No,

sol:- $-\frac{3}{5}$ & $-\frac{3}{5}$
they are same

sol:- $-\frac{1}{4}$ & $\frac{1}{4}$
No.

Q10: Arrange the following rational numbers in ascending order:

a) $\frac{4}{7}, \frac{5}{9}, \frac{2}{5}$

sol:- $\frac{4}{7}, \frac{5}{9}, \frac{2}{5}$

LCM of 7, 9, 5 is = 315

$$\frac{4}{7} \times \frac{45}{45} = \frac{180}{315}$$

$$\frac{5}{9} \times \frac{35}{35} = \frac{175}{315}$$

$$\frac{2}{5} \times \frac{63}{63} = \frac{126}{315}$$

7	7, 9, 5
3	1, 9, 5
3	1, 3, 5
5	1, 1, 5
	1, 1, 1

Arrange the numerators in ascending order.

$$\Rightarrow 126 < 175 < 180$$

$$\Rightarrow \frac{2}{5} < \frac{5}{9} < \frac{4}{7}$$

Q11: Arrange the following rational numbers in descending order:

a) $-\frac{7}{10}, \frac{8}{-15}, \frac{19}{30}, \frac{-2}{-5}$

sol:- $-\frac{7}{10}, -\frac{8}{15}, \frac{19}{30}, \frac{2}{5}$

lcm of 10, 15, 30 and 5 = 30

$$-\frac{7}{10} \times \frac{3}{3} = -\frac{21}{30}$$

$$-\frac{8}{15} \times \frac{2}{2} = -\frac{16}{30}$$

$$\frac{19}{30} \times \frac{1}{1} = \frac{19}{30}$$

$$\frac{2}{5} \times \frac{6}{6} = \frac{12}{30}$$

5	10, 15, 30, 5
2	2, 3, 6, 1
3	1, 3, 3, 1
	1, 1, 1, 1

Arrange the numerators in descending order.

$$19 > 12 > -16 > -21$$

$$\Rightarrow \frac{19}{30} > \frac{2}{5} > -\frac{8}{15} > -\frac{7}{10}$$

Q13: Write the reciprocal of:

a) $-\frac{1}{3}$

sol:- -3

b) -3

sol:- $\frac{1}{-3}$

c) $\frac{2}{13}$

sol:- $\frac{13}{2}$

d) $\frac{9}{-13}$

sol:- $-\frac{13}{9}$

Q14: Find the smallest rational number in each of the following groups of rational numbers:

a) $\frac{2}{-3}, -\frac{5}{6}, -\frac{6}{7}$

sol:- $-\frac{2}{3}, -\frac{5}{6}, -\frac{6}{7}$

lcm of 3, 6 and 7 = 42

$$-\frac{2}{3} \times \frac{14}{14} = -\frac{28}{42}$$

$$-\frac{5}{6} \times \frac{7}{7} = -\frac{35}{42}$$

$$-\frac{6}{7} \times \frac{6}{6} = -\frac{36}{42}$$

3	3, 6, 7
2	1, 2, 7
7	1, 1, 7
	1, 1, 1

comparing the numerators we get

$$-36 < -35 < -28$$

$\Rightarrow -\frac{6}{7}$ is smallest rational number.

Q15: write true or false

a) $|- \frac{1}{3}| = \frac{1}{-3}$

sol:- $|- \frac{1}{3}| = \frac{1}{-3}$

$\Rightarrow \frac{1}{3} \neq \frac{1}{-3}$

false

b) $|- \frac{1}{5}| < -\frac{1}{4}$

sol:- $|- \frac{1}{5}| < -\frac{1}{4}$

$\Rightarrow \frac{1}{5} < -\frac{1}{4}$

$\Rightarrow$ false

c) $\frac{2}{-3} < |- \frac{3}{4}|$

sol:- $\frac{2}{-3} < |- \frac{3}{4}|$

$\Rightarrow \frac{2}{-3} < \frac{3}{4}$

True.

Note $\Rightarrow$ Do remaining parts and Questions by yourself.

Ex: 9.3

Q1:- write the additive inverse of:

a) $-\frac{1}{4}$

sol:- $\frac{1}{4}$

c) $-4/9$

sol:- $4/9$

d) $\frac{-10}{-15}$

sol:- $\frac{-10}{15}$

e) $9/-16$

sol:- $9/16$

Q3:- find the sum:

a) $\frac{5}{6} + \frac{-11}{6}$

sol:- $\frac{5}{6} + \frac{-11}{6}$

$\Rightarrow \frac{5 + (-11)}{6}$

$\Rightarrow \frac{5-11}{6}$

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

e) $\frac{3}{4} + \frac{-7}{8}$

sol:- $\frac{3}{4} + \frac{-7}{8}$

$\Rightarrow \frac{(3 \times 2) - (7 \times 1)}{8}$

$\Rightarrow \frac{6-7}{8} = -\frac{1}{8}$

c) $\frac{17}{10} + \frac{-8}{10}$

sol:- $\frac{17}{10} + \frac{-8}{10}$

$\Rightarrow \frac{17 + (-8)}{10}$

$\Rightarrow \frac{17-8}{10}$

$\Rightarrow \frac{9}{10}$

f) $\frac{-8}{27} + \frac{-2}{9}$

sol:- $\frac{-8}{27} + \frac{-2}{9}$

$\Rightarrow \frac{(-8 \times 1) - (2 \times 3)}{27}$

$\Rightarrow \frac{-8-6}{27} \Rightarrow \frac{-14}{27}$

Q4:- Find the difference:

a) $\frac{7}{12} - \frac{5}{6}$

sol:- $\frac{7}{12} - \frac{5}{6}$

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

$$\Rightarrow \frac{7 - 10}{12}$$

$$\Rightarrow \frac{-3}{12/4} = -\frac{1}{4}$$

e) $\frac{7}{16} - \frac{7}{24}$

sol:- $\frac{7}{16} - \frac{7}{24}$

$$\Rightarrow \frac{(7 \times 3) - 7(2)}{48}$$

$$\Rightarrow \frac{21 - 14}{48}$$

$$\Rightarrow \frac{7}{48}$$

Q5:- Find the product:-

a) $\frac{7}{20} \times -\frac{1}{2}$

sol:- $\frac{7}{20} \times -\frac{1}{2} \Rightarrow -\frac{7}{40}$

Q6:- Divide

a) (-9) by (-7)

sol:- $-9 \div -7$

$$\Rightarrow \frac{+9}{+7}$$

$$\Rightarrow \frac{9}{7}$$

c) $\frac{6}{13} - \frac{5}{20}$

sol:- $\frac{6}{13} - \frac{5}{20}$

$$\Rightarrow \frac{(6 \times 20) - (5 \times 13)}{(13 \times 20)}$$

$$\Rightarrow \frac{120 - 65}{260}$$

$$\Rightarrow \frac{55}{260} = \frac{11}{52}$$

g) $\frac{91}{100} - \frac{21}{25}$

sol:- $\frac{91}{100} - \frac{21}{25}$

$$\Rightarrow \frac{(91 \times 1) - (21 \times 4)}{100}$$

$$\Rightarrow \frac{91 - 84}{100}$$

$$\Rightarrow \frac{7}{100}$$

c) $\frac{2}{9} \times \frac{5}{3}$

sol:- $\frac{2}{9} \times \frac{5}{3} = \frac{10}{27}$

c) $-\frac{16}{13}$ by $-\frac{2}{13}$

sol:- $-\frac{16}{13} \div -\frac{2}{13}$

$$\Rightarrow \frac{-16}{13} \times \frac{13}{-2}$$

$$\Rightarrow 8$$

Q8:- What rational number should be added to $-\frac{7}{8}$ to get $\frac{5}{9}$?

Sol:- Let the number added be $\frac{p}{q}$

Ac. to Q

$$-\frac{7}{8} + \frac{p}{q} = \frac{5}{9}$$

$$\Rightarrow \frac{p}{q} = \frac{5}{9} + \frac{7}{8}$$

$$\Rightarrow \frac{p}{q} = \frac{(5 \times 8) + (7 \times 9)}{9 \times 8}$$

$$\Rightarrow \frac{p}{q} = \frac{40 + 63}{72}$$

$$\Rightarrow \frac{p}{q} = \frac{103}{72}$$

$\therefore$ The reqd. number is $\frac{103}{72}$.

Q10: Simplify:

$$a) \left(\frac{11}{3} \times -\frac{13}{5} \right) - \frac{4}{15}$$

$$\text{Sol:- } \left(\frac{11}{3} \times -\frac{13}{5} \right) - \frac{4}{15}$$

$$\Rightarrow \frac{-143}{15} - \frac{4}{15}$$

$$\Rightarrow \frac{-143 - 4}{15}$$

$$\Rightarrow -\frac{147}{15}$$

Q11: Divide the reciprocal of $\frac{3}{5}$ by $-\frac{1}{5}$

Sol:- Reciprocal of $\frac{3}{5}$ is $\frac{5}{3}$

Ac. to Q

$$\frac{5}{3} \div -\frac{1}{5}$$

$$\Rightarrow \frac{5}{3} \times \frac{5}{-1}$$

$$\Rightarrow \frac{25}{-3}$$

Q12:- Find The Product of $\frac{2}{5}$ and The reciprocal of -2 :

Sol) Reciprocal of -2 is $-\frac{1}{2}$.
Ac. to Q

$$\frac{2}{5} \times -\frac{1}{2}$$

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

Q13: The Product of Two rational numbers is $-\frac{8}{9}$. If one of them is $\frac{10}{3}$. What is the other rational number.

Sol: Let the other rational number be $\frac{p}{q}$.

Ac. to Q

$$\frac{10}{3} \times \frac{p}{q} = -\frac{8}{9}$$

$$\Rightarrow \frac{p}{q} = -\frac{8}{9} \div \frac{10}{3}$$

$$\Rightarrow \frac{p}{q} = \frac{-8}{9} \times \frac{3}{10}$$

$$\Rightarrow \frac{p}{q} = -\frac{4}{3} \times \frac{1}{5}$$

$$\Rightarrow \frac{p}{q} = -\frac{4}{15}$$

$\therefore$ The reqd. number is $-\frac{4}{15}$.

Note: Do remaining parts and Questions by yourself & practice whole unit-II thoroughly.
Good-luck.