

Homework - 20

VIII Revision worksheet - Comparing Quantities & Rational Numbers

- 1) Kanti purchased a sewing machine for Rs 2000. She sold it at a loss of 40%. Find the selling price.
(a) Rs 1200 (b) Rs 400 (c) Rs 800 (d) Rs 2800

Soln:-

$$C.P = \text{Rs } 2000$$

$$\text{loss \%} = 40\%$$

$$S.P = \frac{100 - \text{loss \%}}{100} \times C.P$$

$$= \frac{100 - 40}{100} \times 2000 = \frac{60}{100} \times 2000$$

$$= \text{Rs } 1200 \text{ (a)}$$

- 2) Mithlesh purchased a TV for Rs 10,000 and sold it for Rs 8000. Find her loss %
(a) 10% (b) 20% (c) 40% (d) 60%

Soln:-

$$C.P = \text{Rs } 10,000$$

$$S.P = \text{Rs } 8000$$

$$\text{loss} = C.P - S.P = 10000 - 8000 = \text{Rs } 2000$$

$$\therefore \text{loss \%} = \frac{\text{loss}}{C.P} \times 100 = \frac{2000}{10000} \times 100 = 20\% \text{ (b)}$$

- 3) Sapna purchased a cycle for Rs 1000 and sold it for Rs 1200. Find her gain %
(a) 20% (b) 10% (c) 40% (d) 12%

Soln:-

$$C.P = \text{Rs } 1000$$

$$S.P = \text{Rs } 1,200$$

$$\text{gain} = S.P - C.P = 1200 - 1000 = \text{Rs } 200$$

$$\therefore \text{gain \%} = \frac{\text{gain}}{C.P} \times 100 = \frac{200}{1000} \times 100 = 20\% \text{ (a)}$$

- 4) A sofa-set was bought for Rs 10,000. Its value depreciated at the rate of 10% p.a. Find its value after one year.

(a) Rs 11000 (b) Rs 9000 (c) Rs 10000 (d) Rs 1000

Soln:-

$$C.P = \text{Rs } 10000$$

$$\text{Rate of depreciation} = 10\%$$

$$\text{Value after one year} = 10000 \left(1 - \frac{10}{100}\right)^1$$

$$= 100\% \times \frac{90}{100} = \text{Rs } 9000 \text{ (b)}$$

- 5) The salary of Manish is Rs 10,000. His salary gets increased by 10%. Find his increased salary.
 (a) Rs 9000 (b) Rs 11000 (c) Rs 8000 (d) Rs 12,000

Soln:-

Original salary = Rs 10,000

rate of increase = 10%

$$\begin{aligned} \therefore \text{Increased salary} &= 10000 + 10\% \text{ of } 10000 \\ &= 10000 + \frac{10}{100} \times 10000 \\ &= 10000 \times \frac{110}{100} = \text{Rs } 11000 \text{ (b)} \end{aligned}$$

- 6) In selling a plot of land for Rs 61200, a profit of 20% is made. The cost price of the plot is
 (a) Rs 51000 (b) Rs 50000 (c) Rs 49000 (d) Rs 52000

Soln:-

S.P = Rs 61200

profit% = 20%

$$\begin{aligned} \text{C.P} &= \frac{\text{S.P} \times 100}{100 + \text{profit}\%} = \frac{61200 \times 100}{100 + 20} = \frac{6120000}{120} \\ &= \text{Rs } 51,000 \text{ (a)} \end{aligned}$$

- 7) The simple interest of Rs 500 at the rate of 5% is Rs 100. This interest is of the time
 (a) 1 year (b) 4 years (c) 10 years (d) 20 years.

Soln:-

P = Rs 500

R = 5%

I = Rs 100

$$SI = \frac{PRT}{100} \Rightarrow 100 = \frac{500 \times 5 \times T}{100}$$

$$\Rightarrow T = \frac{100 \times 100}{500 \times 5} = 4 \text{ years (b)}$$

- 8) Waheeda bought an air cooler for Rs 3300 including a tax of 10%. The price of the air cooler before VAT was added is:

(a) Rs 2000 (b) Rs 3000 (c) Rs 2500 (d) Rs 2800

Soln:-

Let the price of the air cooler before VAT was added be ₹x

$$x + 10\% \text{ of } x = 3300$$

$$\Rightarrow x + \frac{10}{100} \times x = 3300$$

$$\Rightarrow \frac{110x}{100} = 3300$$

$$\therefore x = \frac{3300 \times 100}{110} = ₹3000 \text{ (b)}$$

- 9) The difference between the Compound Interest and simple interest on a sum of Rs 100000 at 10% annum for 2 year is
 (a) 1000 (b) 500 (c) 1200 (d) 800

Soln:-

$$P = ₹1,00,000$$

$$R = 10\%$$

$$n = 2 \text{ years}$$

$$\text{Amount} = P \left(1 + \frac{R}{100}\right)^n = 100000 \left(1 + \frac{10}{100}\right)^2$$

$$= 100000 \times \frac{110}{100} \times \frac{110}{100} = ₹1,21,000 //$$

$$C.I. = A - P = 121000 - 100000$$

$$= ₹21000 //$$

$$S.I. = \frac{PRT}{100} = \frac{100000 \times 10 \times 2}{100} = ₹20000 //$$

$$\therefore \text{The required difference} = 21000 - 20000 = ₹1000 \text{ (a)}$$

- 10) The compound interest on Rs 4000 for one year at 5% p.a payable half yearly is
 (a) Rs 400 (b) Rs 405 (c) Rs 200 (d) Rs 202.50

Soln:-

$$P = ₹4000$$

$$n = 1 \text{ year}$$

$$R = 5\%$$

$$\text{Amount} = P \left(1 + \frac{R}{200}\right)^{2n} = 4000 \left(1 + \frac{5}{200}\right)^2$$

$$= 4000 \times \frac{205}{200} \times \frac{205}{200} = ₹4202.50$$

$$C.I. = A - P = 4202.50 - 4000 = ₹202.50 \text{ (d)}$$

11) Write the reciprocal of the following numbers :-

(i) -3

Soln:- Reciprocal is $-\frac{1}{3}$

(ii) $\frac{3}{5}$

Soln:- Reciprocal is $\frac{5}{3}$

(iii) $-\frac{6}{7}$

Soln:- Reciprocal is $-\frac{7}{6}$

12) Write the additive inverse of $\frac{12}{17}$

Soln:- Additive inverse is $-\frac{12}{17}$

13) The sum of two numbers is $\frac{5}{9}$. If one of the numbers is $\frac{1}{3}$, find the other.

Soln:- Let the other number be x .

$$\begin{aligned} \text{Then;} \quad x + \frac{1}{3} &= \frac{5}{9} \Rightarrow x = \frac{5}{9} - \frac{1 \times 3}{3 \times 3} \\ &= \frac{5-3}{9} = \frac{2}{9} \end{aligned}$$

\therefore The other number is $\frac{2}{9}$

14) Simplify $\frac{7}{6} \times -\frac{3}{28}$ and find its reciprocal

Soln:- $\frac{7}{6} \times -\frac{3}{28} = -\frac{1}{8}$

Reciprocal is $-\underline{\underline{8}}$

15) The product of two numbers is 15. If one of the numbers is -10 , find the other.

Soln:- Let the other number be x .

$$\text{Then, } -10 \times x = 15$$

$$x = \frac{+15}{-10}$$

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

\therefore The other number is $-\frac{3}{2}$

16) Write any 3 rational numbers between -5 and 0

Soln:- Any 3 rational numbers between -5 and 0 are -4, -3, -2

17) Simplify $-\frac{4}{13} - -\frac{3}{26}$

$$\text{Soln:- } -\frac{4 \times 2}{13 \times 2} + \frac{3}{26} = -\frac{8+3}{26} = -\frac{5}{26}$$

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

$$\text{Soln:- LHS, } -\frac{2}{5} + \left(\frac{3 \times 2}{5 \times 2} + \frac{1 \times 5}{2 \times 5}\right) = -\frac{2}{5} + \left(\frac{6+5}{10}\right) = \frac{-2 \times 2 + 11}{5 \times 2 \times 10}$$

$$= -\frac{4+11}{10} = \frac{7}{10}$$

$$\text{RHS, } \left(-\frac{2}{5} + \frac{3}{5}\right) + \frac{1}{2} = \left(-\frac{2+3}{5}\right) + \frac{1}{2} = \frac{1 \times 2 + 1 \times 5}{5 \times 2 \times 2 \times 5}$$

$$= \frac{2+5}{10} = \frac{7}{10}$$

\therefore LHS = RHS. Hence verified

19) Verify $\frac{1}{2} \div \left(-\frac{1}{3} \div \frac{2}{5}\right) \neq \left(\frac{1}{2} \div -\frac{1}{3}\right) \div \frac{2}{5}$

$$\text{Soln:- LHS, } \frac{1}{2} \div \left(-\frac{1}{3} \div \frac{2}{5}\right) = \frac{1}{2} \div \left(-\frac{1}{3} \times \frac{5}{2}\right) = \frac{1}{2} \div -\frac{5}{6}$$

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

$$\text{RHS, } \left(\frac{1}{2} \div -\frac{1}{3}\right) \div \frac{2}{5} = \left(\frac{1}{2} \times -3\right) \div \frac{2}{5} = -\frac{3}{2} \div \frac{2}{5}$$

$$= -\frac{3}{2} \times \frac{5}{2} = -\frac{15}{4}$$

\therefore LHS \neq RHS

Hence verified

20) Find $\frac{3}{7} + \frac{6}{11} + -\frac{8}{21}$

Soln:-
$$\left(\frac{3 \times 3}{7 \times 3} + -\frac{8}{21}\right) + \frac{6}{11} = \left(\frac{9-8}{21}\right) + \frac{6}{11} = \frac{1 \times 11}{21 \times 11} + \frac{6 \times 21}{11 \times 21}$$

$$= \frac{11+126}{231} = \frac{137}{231}$$

21) Find 3 rational numbers between $\frac{3}{5}$ and $\frac{3}{4}$

Soln:- $\frac{3 \times 4}{5 \times 4}$ $\frac{3 \times 5}{4 \times 5}$ LCM = 20

$\frac{12 \times 4}{20 \times 4}$ $\frac{15 \times 4}{20 \times 4}$

$\frac{48}{80}$ $\frac{60}{80}$

∴ The required 3 rational numbers are $\frac{49}{80}, \frac{53}{80}, \frac{57}{80}$

22) By what number should $\frac{3}{-14}$ be multiplied so as to get $\frac{5}{12}$?

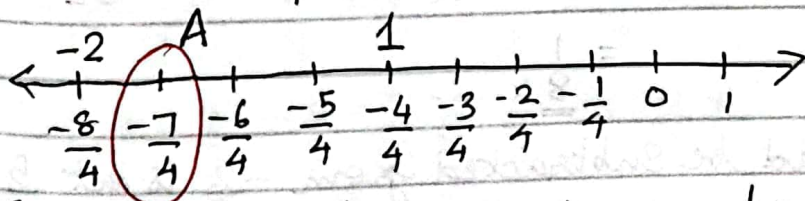
Soln:- Let the required number be x

Then, $x \times \frac{3}{-14} = \frac{5}{12}$

$\Rightarrow x = \frac{5 \times -14}{12 \times 3} = -\frac{35}{18}$

∴ The required number is $-\frac{35}{18}$

23) Represent $-\frac{7}{4}$ on the number line.



Thus A represents $-\frac{7}{4}$ on the number line

24) Find $-\frac{6}{5} \times \frac{3}{8} \times \frac{15}{24} \times -\frac{16}{9}$

Soln:- $\left(-\frac{6^1}{5^1} \times \frac{15^3}{24^4}\right) \times \left(\frac{3^1}{8^1} \times \frac{-16^2}{9^3}\right)$
 $= -\frac{3^1}{4^2} \times -\frac{2^1}{3^1} = \frac{1}{2}$

25) By what number should $-\frac{33}{8}$ be divided to get $-\frac{11}{2}$?

Soln:- Let the required number be x .

Then, $-\frac{33}{8} \div x = -\frac{11}{2}$

$\Rightarrow -\frac{33}{8} \times \frac{1}{x} = -\frac{11}{2}$

$\Rightarrow \frac{1}{x} = \frac{-11 \times 8^4}{-33 \times 3} = \frac{4}{3}$

$\therefore x = \frac{3}{4}$

\therefore The required number is $\frac{3}{4}$

26) Using distributive property find $-\frac{3}{4} \times \frac{2}{3} + -\frac{3}{4} \times \frac{-5}{6}$

Soln:- $-\frac{3}{4} \times \left(\frac{2^{\cancel{+2}}}{3^{\cancel{+2}}} + \frac{-5}{6}\right) = -\frac{3}{4} \times \left(\frac{4-5}{6}\right) = -\frac{3^1}{4} \times \frac{-1}{6^2}$
 $= \frac{1}{8}$

27) What should be subtracted from $-\frac{2}{3}$ to get $\frac{5}{6}$?

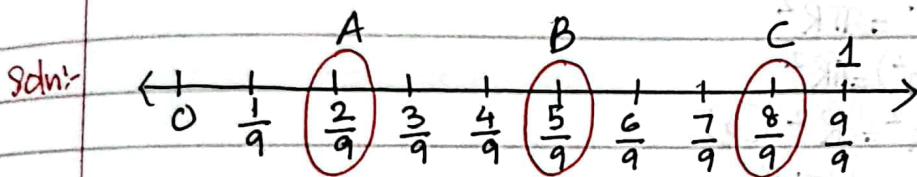
Soln:- Let the required number be x
 $-\frac{2}{3} - x = \frac{5}{6}$

$$-x = \frac{5}{6} + \frac{2x^2}{3 \times 2} = \frac{5+4}{6} = \frac{9}{6} = \frac{3}{2}$$

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

Hence, the required number to be subtracted is $-\frac{3}{2}$

28) Represent the rational numbers $\frac{2}{9}$, $\frac{5}{9}$ and $\frac{8}{9}$ on the number line.



Thus A, B and C represents $\frac{2}{9}$, $\frac{5}{9}$ and $\frac{8}{9}$ respectively on the number line.

29) For $a = \frac{2}{3}$, $b = -\frac{5}{6}$ and $c = \frac{1}{2}$, prove that

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

Soln:-

$$\begin{aligned} \text{LHS, } a \times (b+c) &= \frac{2}{3} \times \left(-\frac{5}{6} + \frac{1 \times 3}{2 \times 3}\right) = \frac{2}{3} \times \left(-\frac{5+3}{6}\right) \\ &= \frac{2}{3} \times \frac{-2}{3} = -\frac{2}{3} \end{aligned}$$

$$\text{RHS, } (a \times b) + (a \times c) = \left(\frac{2}{3} \times -\frac{5}{6}\right) + \left(\frac{2}{3} \times \frac{1}{2}\right)$$

$$= -\frac{5}{9} + \frac{1 \times 3}{3 \times 3} = \frac{-5+3}{9} = -\frac{2}{9}$$

\therefore LHS = RHS. Hence Proved.

30) Simplify: $-\frac{4}{9} \times \frac{2}{5} + \frac{1}{7} + \frac{4}{9} \times \frac{7}{10}$

Soln:-

$$\begin{aligned} \left(-\frac{4}{9} \times \frac{2}{5} + \frac{4}{9} \times \frac{7}{10}\right) + \frac{1}{7} &= \frac{4}{9} \times \left(\frac{-2 \times 2}{5 \times 2} + \frac{7}{10}\right) + \frac{1}{7} \\ &= \frac{4}{9} \times \left(\frac{-4+7}{10}\right) + \frac{1}{7} \\ &= \left(\frac{4}{9} \times \frac{3}{10}\right) + \frac{1}{7} = \frac{2 \times 7}{15 \times 7} + \frac{1 \times 15}{7 \times 15} \\ &= \frac{14+15}{105} = \frac{29}{105} \end{aligned}$$