Exercise 1.7

Q.1 Divide

(i) 1 by $\frac{1}{2}$ $= 1 \div \frac{1}{2} = 1 \times 2 = 2$

(ii) 5 by $\frac{-5}{7}$ $= 5 \div \frac{-5}{7} = 5 \times \frac{7}{-5} = \frac{35}{-5} = -7$

(iii) $\frac{-3}{4}$ by $\frac{9}{-16}$ $= \frac{-3}{4} \div \frac{9}{-16} = \frac{-3}{4} \times \frac{-16}{9} = \frac{48}{36} = \frac{4}{3}$

(iv) $\frac{-7}{8}$ by $\frac{-21}{16}$ $= \frac{-7}{8} \div \frac{-21}{16} = \frac{\cancel{-7}^{1}}{\cancel{8}_{1}} \times \frac{\cancel{16}^{2}}{\cancel{-21}_{3}} = \frac{2}{3}$

(v) $\frac{7}{-4}$ by $\frac{63}{64}$ $= \frac{7}{-4} \div \frac{63}{64} = \frac{\cancel{7}^{1}}{\cancel{-4}} \times \frac{\cancel{64}^{16}}{\cancel{63}_{9}} = \frac{-16}{9}$

(vi) 0 by $\frac{-7}{5}$ $= 0 \div \frac{-7}{5} = 0 \times \frac{5}{-7} = \frac{0}{-7} = 0$

(vii) $\frac{-3}{4}$ by -6 $= \frac{-3}{4} \div -6 = \frac{-3}{4} \times \frac{1}{-6} = \frac{1}{8}$

(viii) $\frac{2}{3}$ by $\frac{-7}{12}$ $= \frac{2}{3} \times \frac{12}{-7} = \frac{8}{-7} = \frac{-8}{7}$

(ix) -4 by $\frac{-3}{5}$ $= -4 \div \frac{-3}{5} = -4 \times \frac{5}{-3} = \frac{20}{3}$

(x) $\frac{-3}{13}$ by $\frac{-4}{65}$ $= \frac{-3}{\cancel{13}_{1}} \times \frac{\cancel{65}^{5}}{-4} = \frac{15}{4}$

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Q.2 Find the value and express as a rational number in standard form.

(i) $\frac{2}{5} \div \frac{26}{15}$ (ii) $\frac{10}{3} \div \frac{-35}{12}$ (iii) $-6 \div \left(\frac{-8}{17}\right)$

(iv) $\frac{-40}{99} \div (-20)$ (v) $\frac{-22}{27} \div \frac{-110}{18}$ (vi) $\frac{-36}{125} \div \frac{-3}{75}$

Solution:

(i) $\frac{2}{5} \div \frac{26}{15} = \frac{2}{5} \times \frac{15}{26} = \frac{3}{13}$

(ii) $\frac{10}{3} \div \frac{-35}{12} = \frac{\overset{2}{\cancel{10}}}{\cancel{3}} \times \frac{\overset{4}{\cancel{12}}}{\underset{7}{\cancel{-35}}} = \frac{8}{-7} = \frac{-8}{7}$

(iii) $-6 \div \left(\frac{-8}{17}\right) = \frac{\overset{3}{\cancel{-6}}}{\cancel{-8_4}} \times \frac{17}{} = \frac{51}{4}$

(iv) $\frac{-40}{99} \div -20 = \frac{-40}{99} \times \frac{1}{-20} = \frac{2}{99}$

(v) $\frac{-22}{27} \div \frac{-110}{18} = \frac{\overset{2}{\cancel{-22}}}{\underset{3}{\cancel{27}}} \times \frac{\overset{2}{\cancel{18}}}{\underset{10}{\cancel{-110}}} = \frac{4}{30} = \frac{2}{15}$

(vi) $\frac{-36}{125} \div \frac{-3}{75} = \frac{\overset{12}{\cancel{-36}}}{\underset{5}{\cancel{125}}} \times \frac{\overset{3}{\cancel{75}}}{\cancel{-3}} = \frac{36}{5}$

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Q.3 The product of two rational numbers is 15. If one of the number is -10. Find the other.

Solution: $\because$ Product of two numbers $= 15$

one number $= -10$

$\therefore$ other number $= 15 \div -10$

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

Q.4 The product of two rational numbers is $-\frac{8}{9}$. If one of the numbers is $-\frac{4}{15}$. find other.

Solution: $\because$ product $= -\frac{8}{9}$

one number $= -\frac{4}{15}$

$\therefore$ other number $= -\frac{8}{9} \div -\frac{4}{15} = \frac{-8^{2}}{9_{3}} \times \frac{15^{5}}{-4_{1}}$

$= \frac{10}{3}$

Q.5 By what number should we multibly $-\frac{1}{6}$ so as to get product $-\frac{23}{9}$.

Solution: let $-\frac{1}{6}$ should be multiply by x

$-\frac{1}{6} \times x = -\frac{23}{9}$

$\Rightarrow x = -\frac{23}{9} \div -\frac{1}{6} = -\frac{23}{\cancel{9}_{3}} \times \frac{\cancel{6}^{2}}{-1} = \frac{46}{3}$

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Q.6 By what number should we multiply $-\frac{15}{28}$ so that the product may be $-\frac{5}{7}$?

Solution: Let required number be x

$$\therefore \quad \frac{-15}{28} \times x = \frac{-5}{7}$$

$$\Rightarrow \quad x = -\frac{5}{7} \div -\frac{15}{28} = \frac{-5}{7_1} \times \frac{28^4}{-15_3}$$

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

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

Q.7 By what number should we multiply $-\frac{8}{13}$ so that the product may be 24?

Solution: Let required no. be x

$$\therefore \quad \frac{-8}{13} \times x = 24$$

$$\Rightarrow \quad x = 24 \div \frac{-8}{13}$$

$$= 24 \times \frac{13}{-8} = -39$$

$$\therefore \quad x = -39$$

Q.8 By what number should $-\frac{3}{4}$ be multiplied in order to produce $\frac{2}{3}$?

Solution: Let required no. be x

$$-\frac{3}{4} \times x = \frac{2}{3} \quad \Rightarrow x = \frac{2}{3} \div -\frac{3}{4}$$

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$$x = \frac{2}{3} \times \frac{4}{-3} = \frac{8}{-9}$$

$$\therefore \quad x = \frac{-8}{9}$$

Q.9 Find $(x+y) \div (x-y)$ if

(i) $x = \frac{2}{3}, \; y = \frac{3}{2}$ (ii) $x = \frac{2}{5}, \; y = \frac{1}{2}$

(iii) $x = \frac{5}{4}, \; y = \frac{-1}{3}$ (iv) $x = \frac{2}{7}, \; y = \frac{4}{3}$

(v) $x = \frac{1}{4}, \; y = \frac{3}{2}$

Solution (i) $x = \frac{2}{3}, \; y = \frac{3}{2}$

$$(x+y) \div (x-y) = \left(\frac{2}{3} + \frac{3}{2}\right) \div \left(\frac{2}{3} - \frac{3}{2}\right)$$

$$= \left(\frac{4+9}{6}\right) \div \left(\frac{4-9}{6}\right)$$

$$= \frac{13}{6} \div \frac{-5}{6}$$

$$= \frac{13}{6} \times \frac{6}{-5} = \frac{13}{-5} = \frac{-13}{5}$$

(ii) $x = \frac{2}{5}, \; y = \frac{1}{2}$

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

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

$$= \frac{9}{10} \div \frac{-1}{10}$$

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$$= \frac{9}{10} \times \frac{10}{-1} = -9$$

(iii) $x = \frac{5}{4}, \; y = \frac{-1}{3}$

$$(x+y) \div (x-y) = \left\{\frac{5}{4} + \left(\frac{-1}{3}\right)\right\} \div \left\{\frac{5}{4} - \left(\frac{-1}{3}\right)\right\}$$

$$= \left(\frac{5}{4} - \frac{1}{3}\right) \div \left(\frac{5}{4} + \frac{1}{3}\right)$$

$$= \left(\frac{15-4}{12}\right) \div \left(\frac{15+4}{12}\right)$$

$$= \frac{11}{12} \div \frac{19}{12} = \frac{11}{12} \times \frac{12}{19} = \frac{11}{19}$$

(iv) $x = \frac{2}{7}, \; y = \frac{4}{3}$

$$(x+y) \div (x-y) = \left(\frac{2}{7} + \frac{4}{3}\right) \div \left(\frac{2}{7} - \frac{4}{3}\right)$$

$$= \left(\frac{6+28}{21}\right) \div \left(\frac{6-28}{21}\right)$$

$$= \frac{34}{21} \div \frac{-22}{21}$$

$$= \frac{34}{21} \times \frac{21}{-22} = \frac{17}{-11} = \frac{-17}{11}$$

(v) $x = \frac{1}{4}, \; y = \frac{3}{2}$

$$\therefore (x+y) \div (x-y) = \left(\frac{1}{4} + \frac{3}{2}\right) \div \left(\frac{1}{4} - \frac{3}{2}\right)$$

$$= \left(\frac{1+6}{4}\right) \div \left(\frac{1-6}{4}\right) = \frac{7}{4} \div \frac{-5}{4}$$

$$= \frac{7}{4} \times \frac{4}{-5} = \frac{-7}{5}$$

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Q.10 The cost of $2\frac{1}{3}$ metres of cloth is Rs $75\frac{1}{4}$. Find the cost of cloth per metre.

Solution :

$\therefore$ cost of $2\frac{1}{3}$ m cloth = Rs $75\frac{1}{4}$

$\therefore$ cost of 1 m cloth = $75\frac{1}{4} \div 2\frac{1}{3}$

$= \frac{301}{4} \div \frac{7}{3}$

$= \frac{\overset{43}{301}}{4} \times \frac{3}{\cancel{7}} = \frac{129}{4}$

$= $ Rs $32\frac{1}{4}$

$= $ Rs 32.25

Q.11 By what number should $-\frac{33}{16}$ be divided to get $\frac{-11}{4}$?

Sol: Let req. no. be x

$$-\frac{33}{16} \div x = \frac{-11}{4}$$

$$\Rightarrow x = -\frac{33}{16} \div \frac{-11}{4}$$

$$= \frac{-\overset{3}{\cancel{33}}}{\underset{4}{\cancel{16}}} \times \frac{\overset{1}{\cancel{4}}}{\cancel{-11}} = \frac{3}{4}$$

$\therefore$ required no. $= \frac{3}{4}$

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Q.13 Divide the sum of $-\frac{13}{5}$ and $\frac{12}{7}$ by the Product of $-\frac{31}{7}$ and $-\frac{1}{2}$

Solution: $\left(-\frac{13}{5}+\frac{12}{7}\right) \div \left(-\frac{31}{7} \times -\frac{1}{2}\right)$

$= \left(\frac{-91+60}{35}\right) \div \left(\frac{31}{14}\right) = -\frac{31}{35_5} \times \frac{14^2}{31}$

$= \qquad\qquad = -\frac{2}{5}$

Q.14 Divide the sum of $\frac{65}{12}$ and $\frac{12}{7}$ by their difference.

Sol: $\left(\frac{65}{12}+\frac{12}{7}\right) \div \left(\frac{65}{12}-\frac{12}{7}\right)$

$= \left(\frac{455+144}{84}\right) \div \left(\frac{455-144}{84}\right)$

$= \frac{599}{84} \div \frac{311}{84} \quad = \frac{599}{84} \times \frac{84}{311} = \frac{599}{311}$

Q.15 If 24 trousers of equal size can be prepar in 54 metres of cloth. What length of cloth is required for each trouser.

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Sol: Length of cloth required for 24 trouser
= 54 metre.

∴ Length of cloth required for one trouser
= 54 ÷ 12

$= \frac{54}{12} = \frac{9}{2}$

$= 4\frac{1}{2}$ metres.

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