



Exercise 1.1

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| <p>1. (a) $0 \times 30 = 0$</p> <p>(c) $8 \times (-7) = -56$</p> <p>(e) $32 \times (-9) = -288$</p> <p>2. (a) $(-9) \times 4$
 $= -(9 \times 4) = -36$</p> <p>(c) $7 \times (-35)$
 $= -(7 \times 35)$
 $= -245$</p> <p>(e) $(-7) \times (-49)$
 $= -[7 \times (-49)]$
 $= +7 \times 49 = 343$</p> <p>(g) $(-1) \times (-3) \times (6)$
 $= -[1 \times (-3)] \times 6$
 $= +(1 \times 3) \times 6$
 $= 3 \times 6 = 18$</p> <p>(i) $(-10) \times 0 \times (-18)$
 $= -(10 \times 0) \times (-18)$
 $= -(0) \times (-18)$
 $= +(0 \times 18)$
 $= 0$</p> <p>(k) $2 \times (-3) \times 4 \times (-5)$
 $= -(2 \times 3) \times 4 \times (-5)$
 $= -6 \times [-(-4 \times 5)]$
 $= +(6 \times 20) = 120$</p> <p>3. (a) $(-9) \times 0 \times (12) = 0$</p> <p>(c) $121 \div (-11) = -11$</p> <p>(e) $0 \div 25 = 0$</p> <p>(g) $(-7) \times (-3) \times (-5) = -105$</p> <p>4. (a) $0 \div 8 = 0$</p> <p>(d) $(-27) \div (-9) = 3$</p> <p>(g) $-49 \div (-7) = 7$</p> <p>(j) $95 \div (-19) = -5$</p> <p>5. (a) $20 \div (-5) = -4 = 4$</p> <p>(c) $(-10) - (-15) \div 5 - (-2)$
 $= -10 + 15 \div 5 + 2$
 $= -10 + 3 + 2$
 $= -10 + 5 = -5 = 5$</p> | <p>(b) $(-12) \times 0 = 0$</p> <p>(d) $(-25) \times 8 = -200$</p> <p>(f) $(-15) \times (-12) = 180$</p> <p>(b) $0 \times (-52)$
 $= -(0 \times 52) = 0$</p> <p>(d) $(-17) \times (-2)$
 $= -[17 \times (-2)]$
 $= +17 \times 2 = 34$</p> <p>(f) $(-18) \times (-13)$
 $= -[18 \times (-13)]$
 $= +18 \times 13 = 234$</p> <p>(h) $(-5) \times (-5) \times (-5)$
 $= -[5 \times (-5)] \times (-5)$
 $= +(5 \times 5) \times (-5)$
 $= 25 \times (-5) = -(25 \times 5) = -125$</p> <p>(j) $10 \times (-9) \times (-9)$
 $= -[10 \times 9] \times (-9)$
 $= -90 \times (-9)$
 $= +(90 \times 9)$
 $= 810$</p> <p>(l) $(-3) \times (-3) \times 0 \times (-6)$
 $= +[3 \times 3] \times [-(-0 \times 6)]$
 $= 9 \times [0]$
 $= (9 \times 0) = 0$</p> <p>(b) $(-1) \times (-1) \times (+1) = 1$</p> <p>(d) $-169 \div (-13) = 13$</p> <p>(f) $(-12) \div (-12) = 1$</p> <p>(h) $(-10) \times 5 \times (-10) = 500$</p> <p>(b) $15 \div (-3) = -5$</p> <p>(c) $0 \div 32 = 0$</p> <p>(e) $(-60) \div 4 = -15$</p> <p>(f) $36 \div (-36) = -1$</p> <p>(h) $(-72) \div 8 = -9$</p> <p>(i) $(+88) \div 11 = 8$</p> <p>(k) $(-70) \div (-10) = 7$</p> <p>(l) $(-250) \div 5 = -50$</p> <p>(b) $6 \times (-3) = -18 = 18$</p> <p>(d) $6 \times (-5) - (-3)$
 $= -30 + 3$
 $= -27$
 $= 27$</p> |
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6. (a) True (b) False (c) True (d) True (e) False (f) True
 7. Let the integer be x which gives $(+35)$ when multiplied by (-1) .

Then,

$$\begin{aligned}x \times (-1) &= +35 \\x &= 35 \div (-1) \\&= -35\end{aligned}$$

Hence, the required number is (-35) .

8. Let the integer be x which gives (-67) when multiplied by $(+1)$.

Then,

$$\begin{aligned}x \times (+1) &= (-67) \\x &= 67 \div (+1) \\&= -67\end{aligned}$$

Hence, the required number is (-67) .

9. Let the integers be x .

Then,

$$\begin{aligned}x \div (-2) &= 42 \\x \times \frac{1}{(-2)} &= 42 \\x &= 42 \times (-2) = (-84)\end{aligned}$$

Hence, the required number is (-84) .

Exercise 1.2

1. (a) $(-27) \div 27 = -1$ (b) $125 \div (-125) = 1$
 (c) $0 \div 29 = 0$ (d) $(-13) - (-13) = 0$
 (e) $(12) - 25 = -13$ (f) $7 \times (-5) = -5 \times 5$
 (g) $(-15) \times 0 = 0 = 0 \times (-15)$
 (h) $[(7 \times -3)] \times (-6) = 7 \times [(-13) \times -6]$
2. (a) True (b) False (c) False (d) True (e) True (f) False
3. (a) $[(-12) + 9] + 7 = (-12) + [9 + 7]$
 LHS $= [-12 + 9] + 7 = -3 + 7 = 4$
 RHS $= (-12) + [9 + 7] = (-12) + 16 = -12 + 16 = 4$
 Thus, LHS = RHS; Associative property of addition.
 (b) $[15 + (-3)] + 6 = 15 + [(-3) + 6]$
 LHS. $= [15 + (-3)] + 6 = [15 - 3] + 6 = 12 + 6 = 18$
 RHS. $= 15 + [(-3) + 6] = 15 + [-3 + 6] = 15 + 3 = 18$
 LHS = R.H.S; Associative property of addition.
4. (a) 575×104 (b) $625 + (-315) + 75$ (c) $(-142) + (-58) + 200$
 $= 575 \times (100 + 4)$ $= [625 - 315] + 75$ $= -[142 + 58] + 200$
 $= 575 \times 100 + 575 \times 4$ $= 310 + 75$ $= -200 + 200$
 $= 57500 + 2300$ $= 385$ $= 0$
 $= 59800$
- (d) $123 \times 7 + 123 \times 3$ (e) $(-50) \times 125 \times (-6) \times 8$
 $= 123 [7 + 3]$ $= -[50 \times 125] \times (-6) \times 8$
 $= 123 \times 10$ $= -6250 \times (-48)$
 $= 1230$ $= 300000$

5. Let the integer be x which gives 9 when divided by (-7) .

Then,

$$\begin{aligned}x \div (-7) &= 9 \\x \times \frac{1}{(-7)} &= 9 \\x &= 9 \times (-7) \\x &= -63\end{aligned}$$

Hence, the required integer is (-63) .

6. $(-7) \times [3 - 4]$
 $= (-7) \times 3 - (-7) \times 4$ [By distributive property of multiplication over subtraction]
 $= -21 + 28$
 $= 7$
7. Let the integer be x which gives (-25) when multiplied with (-1) .

Then,

$$\begin{aligned}x \times (-1) &= (-25) \\x &= (-25) \div (-1) \\x &= 25\end{aligned}$$

Hence, the required integer is 25.

8. Let the integer be x which gives (-47) when divided by (-1) .

Then,

$$\begin{aligned}x \div (-1) &= (-47) \\x \times \frac{1}{(-1)} &= (-47) \\x &= (-47) \times (-1) \\x &= 47\end{aligned}$$

Hence, the required integer is 47.

9. Rehana earn every day = ₹ 175
 \therefore Rehana earn in 10 days = ₹ 175×10
= ₹ 1750

Hence, she will have ₹ 1750 after 10 days.

10. A man withdraws every day = ₹ 200
 \therefore a man withdraws in 5 days = ₹ 5×200
= ₹ 1000

Hence, he will have ₹ 1000 withdraw over these five days.

MCQs

1. (c) 2. (d) 3. (a) 4. (c) 5. (a) 6. (d)

2

Multiplication and Division of Fractions



Exercise 2.1

1. (a) $\frac{3}{7} \times \frac{2}{5} = \frac{3 \times 2}{7 \times 5} = \frac{6}{35}$ (b) $\frac{2}{5} \times \frac{3}{4} = \frac{2 \times 3}{5 \times 4} = \frac{6}{20} = \frac{3}{10}$

$$(c) \frac{4}{9} \times \frac{3}{5} = \frac{4 \times 3}{9 \times 5} = \frac{4}{3 \times 5} = \frac{4}{15} \quad (d) \frac{4}{9} \times \frac{5}{8} = \frac{4 \times 5}{9 \times 8} = \frac{5}{9 \times 2} = \frac{5}{18}$$

$$(e) \frac{5}{12} \times 8 = \frac{5 \times 8}{12} = \frac{5 \times 2}{3} = \frac{10}{3} = 3\frac{1}{3} \quad (f) \frac{7}{6} \text{ of } \frac{3}{14} = \frac{7}{6} \times \frac{3}{14} = \frac{1 \times 1}{2 \times 2} = \frac{1}{4}$$

$$(g) \frac{3}{10} \text{ of } \frac{5}{12} = \frac{3}{10} \times \frac{5}{12} = \frac{3 \times 5}{10 \times 12} = \frac{1 \times 1}{2 \times 4} = \frac{1}{8}$$

$$(h) 3\frac{3}{8} \times 3\frac{6}{7} = \frac{27}{8} \times \frac{27}{7} = \frac{729}{56} = 13\frac{1}{56}$$

$$(i) \frac{1}{2} \text{ of } \frac{1}{3} \times \frac{3}{4} = \frac{1}{2} \times \left(\frac{1}{3} \times \frac{3}{4} \right) = \frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$$

$$(j) \frac{3}{7} \times \frac{5}{9} \times 4\frac{1}{5} = \frac{3}{7} \times \frac{5}{9} \times \frac{21}{5} = \frac{15 \times 21}{35 \times 9} = \frac{315}{315} = 1$$

$$(k) 1\frac{1}{3} \times 1\frac{2}{7} \times 1\frac{1}{4} = \frac{4}{3} \times \frac{9}{7} \times \frac{5}{4} = \frac{3}{7} \times 5 = \frac{15}{7} = 2\frac{1}{7}$$

2. (a) $\frac{3}{4} \div \frac{2}{3} = \frac{3}{4} \times \frac{3}{2} = \frac{9}{8} = 1\frac{1}{8}$

(b) $\frac{2}{3} \div 1\frac{1}{5} = \frac{2}{3} \div \frac{6}{5} = \frac{2}{3} \times \frac{5}{6} = \frac{10}{18} = \frac{5}{9}$

(c) $4\frac{1}{2} \div \frac{4}{9} = \frac{9}{2} \div \frac{4}{9} = \frac{9}{2} \times \frac{9}{4} = \frac{81}{8} = 10\frac{1}{8}$

(d) $1 \div \frac{2}{5} = 1 \times \frac{5}{2} = 2\frac{1}{2}$

(e) $\frac{4}{9} \div \frac{4}{9} = \frac{4}{9} \times \frac{9}{4} = 1$

(f) $2\frac{1}{3} \div 1\frac{3}{4} = \frac{7}{3} \div \frac{7}{4} = \frac{7}{3} \times \frac{4}{7} = \frac{4}{3} = 1\frac{1}{3}$

(g) $2\frac{2}{3} \times 3 \times \frac{1}{2} \div 2\frac{4}{9} = \frac{8}{3} \times \frac{7}{2} \div \frac{22}{9}$
 $= \frac{8}{3} \times \frac{7}{2} \times \frac{9}{22} = \frac{4 \times 7 \times 3}{1 \times 1 \times 22} = \frac{2 \times 7 \times 3}{11} = \frac{42}{11} = 3\frac{9}{11}$

(h) $2\frac{2}{7} \div 2\frac{4}{9} = \frac{16}{7} \div \frac{22}{9} = \frac{16}{7} \times \frac{9}{22} = \frac{8 \times 9}{7 \times 11} = \frac{72}{77}$

(i) $3\frac{1}{7} \div 1\frac{1}{2} = \frac{22}{7} \div \frac{3}{2} = \frac{22}{7} \times \frac{2}{3} = \frac{44}{21} = 2\frac{2}{21}$

(j) $2\frac{1}{2} \div 5\frac{1}{2} = \frac{5}{2} \div \frac{11}{2} = \frac{5}{2} \times \frac{2}{11} = \frac{5}{11}$

(k) $4\frac{1}{7} \div \frac{3}{14} = \frac{29}{7} \div \frac{3}{14} = \frac{29}{7} \times \frac{14}{3} = \frac{29 \times 2}{3} = \frac{58}{3} = 19\frac{1}{3}$

3. (a) $\frac{1}{4} \text{ of } 2\frac{2}{7} \div \frac{3}{5}$

$$= \frac{1}{4} \times \frac{16}{7} \div \frac{3}{5} = \frac{4}{7} \div \frac{3}{5} = \frac{4}{7} \times \frac{5}{3} = \frac{20}{21}$$

(b) $1\frac{1}{4} \times \frac{1}{2} \div 1\frac{1}{3} = \frac{5}{4} \times \frac{1}{2} \div \frac{4}{3} = \frac{5}{8} \div \frac{4}{3} = \frac{5}{8} \times \frac{3}{4} = \frac{15}{32}$

$$(c) 6\frac{1}{7} \times 0 \times 5\frac{3}{8} \\ = \frac{43}{7} \times 0 \times \frac{43}{8} = 0 \times \frac{43}{8} = 0$$

$$(d) \frac{3}{4} \times 1\frac{1}{3} \div \frac{3}{7} \text{ of } 2\frac{5}{8} \\ = \frac{3}{4} \times \frac{4}{3} \div \frac{3}{7} \times \frac{21}{8} = 1 \div \frac{3 \times 3}{8} = 1 \div \frac{9}{8} = 1 \times \frac{8}{9} = \frac{8}{9}$$

$$(e) 2\frac{1}{4} \div \frac{2}{7} \text{ of } 1\frac{1}{3} \times \frac{2}{3} \\ = \frac{9}{4} \div \frac{2}{7} \times \frac{4}{3} \times \frac{2}{3} = \frac{9}{4} \times \frac{7}{2} \times \frac{4}{3} \times \frac{2}{3} = \frac{9 \times 7 \times 8}{8 \times 9} = 7$$

$$(f) \left(\frac{3}{7} \div \frac{1}{2}\right) \times 1\frac{1}{7} = \left(\frac{3}{7} \times \frac{2}{1}\right) \times \frac{8}{7} = \frac{6}{7} \times \frac{8}{7} = \frac{48}{49}$$

$$(g) \left(1\frac{7}{8} \div 1\frac{1}{2}\right) \text{ of } \left(8\frac{1}{3} \div 1\frac{1}{2}\right) = \left(\frac{15}{8} \div \frac{2}{3}\right) \text{ of } \left(\frac{25}{3} \div \frac{3}{2}\right) \\ = \left(\frac{15}{8} \times \frac{3}{2}\right) \text{ of } \left(\frac{25}{3} \times \frac{2}{3}\right) \\ = \frac{5}{4} \text{ of } \frac{50}{9} = \frac{5 \times 50}{4 \times 9} = \frac{5 \times 25}{18} = \frac{125}{18} = 6\frac{17}{18}$$

$$(h) \frac{1}{3} \text{ of } 60 \div 60 = \frac{1}{3} \times 60 \div 60 = 20 \div 60 = 20 \times \frac{1}{60} = \frac{20}{60} = \frac{1}{3}$$

$$4. (a) 5 - \left(\frac{8}{11} - \frac{3}{11}\right) = 5 - \left(\frac{8-3}{11}\right) = 5 - \frac{5}{11} = \frac{55-5}{11} = \frac{50}{11} = 4\frac{6}{11}$$

$$(b) \frac{1}{2} \div \left(\frac{7}{8} - \frac{3}{5}\right) = \frac{1}{2} \div \left(\frac{7 \times 5 - 8 \times 3}{40}\right) \\ = \frac{1}{2} \div \left(\frac{35-24}{40}\right) \\ = \frac{1}{2} \div \left(\frac{11}{40}\right) = \frac{1}{2} \times \frac{40}{11} = \frac{40}{22} = \frac{20}{11} = 1\frac{9}{11}$$

$$(c) 2\frac{1}{3} \div \left(5\frac{1}{2} + 3\frac{3}{4}\right) = \frac{7}{3} \div \left(\frac{11}{2} + \frac{15}{4}\right) \\ = \frac{7}{3} \div \left(\frac{11 \times 2 + 15}{4}\right) \\ = \frac{7}{3} \div \left(\frac{22+15}{4}\right) = \frac{7}{3} \div \frac{37}{4} = \frac{7}{3} \times \frac{4}{37} = \frac{28}{111}$$

$$(d) \left(\frac{7}{8} - \frac{3}{5}\right) \div \frac{1}{2} = \left(\frac{7 \times 5 - 3 \times 8}{40}\right) \div \frac{1}{2} = \left(\frac{35-24}{40}\right) \div \frac{1}{2} = \frac{11}{40} \div \frac{1}{2} = \frac{11}{40} \times 2 = \frac{11}{20}$$

$$(e) \frac{4}{7} \div \left(\frac{1}{3} \times 2\frac{4}{5}\right) = \frac{4}{7} \div \left(\frac{1}{3} \times \frac{14}{5}\right) = \frac{4}{7} \div \frac{14}{15} = \frac{4}{7} \times \frac{15}{14} = \frac{30}{49}$$

$$(f) \frac{3}{4} \div \left(\frac{1}{6} \div \frac{1}{2}\right) = \frac{3}{4} \div \left(\frac{1}{6} \times 2\right) = \frac{3}{4} \div \left(\frac{1}{3}\right) = \frac{3}{4} \times 3 = 2\frac{1}{4}$$

$$\begin{aligned}
 \text{(g)} \quad \left(\frac{1}{4} - \frac{1}{6}\right) \text{ of } \left(\frac{2}{3} - \frac{5}{12}\right) \times \left(\frac{5}{8} - \frac{7}{12}\right) &= \left(\frac{3-2}{12}\right) \text{ of } \left(\frac{8-5}{12}\right) \times \left(\frac{15-4}{24}\right) \\
 &= \frac{1}{12} \text{ of } \frac{3}{12} \times \frac{1}{24} \\
 &= \frac{1}{12} \times \frac{3}{12} \times \frac{1}{24} = \frac{1}{1152}
 \end{aligned}$$

$$\text{5. (a)} \quad \left(\frac{1}{2} + \frac{1}{3}\right) \div \left(\frac{1}{4} - \frac{1}{6}\right) = \left(\frac{3+2}{6}\right) \div \left(\frac{3-2}{12}\right) = \frac{5}{6} \div \frac{1}{12} = \frac{5}{6} \times 12 = 5 \times 2 = 10$$

$$\begin{aligned}
 \text{(b)} \quad \left(\frac{24}{35} \div \frac{6}{7} + \frac{5}{9}\right) \times \frac{3}{4} &= \left(\frac{24}{35} \times \frac{7}{6} + \frac{5}{9}\right) \times \frac{3}{4} \\
 &= \left(\frac{4}{5} + \frac{5}{9}\right) \times \frac{3}{4} \\
 &= \left(\frac{36+25}{45}\right) \times \frac{3}{4} = \frac{61}{45} \times \frac{3}{4} = \frac{61}{15 \times 4} = \frac{61}{60} = 1\frac{1}{60}
 \end{aligned}$$

$$\begin{aligned}
 \text{(c)} \quad \frac{3}{4} \text{ of } 6\frac{1}{8} - \frac{2}{3} \text{ of } 2\frac{1}{4} &= \frac{3}{4} \text{ of } \frac{49}{8} - \frac{2}{3} \text{ of } \frac{9}{4} \\
 &= \left(\frac{3}{4} \times \frac{49}{8}\right) - \left(\frac{2}{3} \times \frac{9}{4}\right) \\
 &= \frac{147}{32} - \frac{18}{12} \\
 &= \frac{147 \times 3 - 18 \times 8}{96} = \frac{441 - 144}{96} = \frac{297}{96} = \frac{99}{32} = 3\frac{3}{32}
 \end{aligned}$$

$$\begin{aligned}
 \text{(d)} \quad \frac{7}{30} \text{ of } \left(\frac{1}{3} + \frac{7}{15}\right) \div \left(\frac{5}{6} - \frac{3}{5}\right) &= \frac{7}{30} \text{ of } \left(\frac{5+7}{15}\right) \div \left(\frac{25-18}{30}\right) \\
 &= \frac{7}{30} \text{ of } \frac{12}{15} \div \frac{7}{30} = \frac{7}{30} \times \frac{12}{15} \times \frac{30}{7} = \frac{12}{15} = \frac{4}{5}
 \end{aligned}$$

$$\begin{aligned}
 \text{(e)} \quad 2\frac{1}{2} - 3\frac{1}{2} \times 1\frac{3}{4} + 2\frac{2}{4} &= \frac{5}{2} - \frac{7}{2} \times \frac{7}{4} + \frac{10}{4} \\
 &= \left(\frac{5}{2} - \frac{7}{2}\right) \times \left(\frac{7}{4} + \frac{10}{4}\right) \\
 &= \left(\frac{5-7}{2}\right) \times \left(\frac{7+10}{4}\right) \\
 &= -\frac{2}{2} \times \left(\frac{17}{4}\right) = -1 \times \frac{17}{4} = -\frac{17}{4} = -4\frac{1}{4}
 \end{aligned}$$

$$\begin{aligned}
 \text{(f)} \quad 4\frac{5}{7} \left(3\frac{1}{8} \div \frac{11}{12}\right) &= \frac{33}{7} \times \left(\frac{25}{8} \div \frac{11}{12}\right) \\
 &= \frac{33}{7} \times \left(\frac{25}{8} \times \frac{12}{11}\right) \\
 &= \frac{33}{7} \times \left(\frac{25 \times 3}{2 \times 11}\right) = \frac{33}{7} \times \frac{75}{22} = \frac{3 \times 75}{7 \times 2} = \frac{225}{14} = 16\frac{1}{14}
 \end{aligned}$$

- (g) $\frac{2}{5}$ of $\left(\frac{1}{7} - \frac{1}{12}\right)$ of $1\frac{2}{5} = \frac{2}{5} \times \left(\frac{12-7}{84}\right) \times \frac{7}{5}$
 $= \frac{2}{5} \times \frac{5}{84} \times \frac{7}{5}$
 $= \frac{2 \times 7}{84 \times 5} = \frac{14}{84 \times 5} = \frac{2}{12 \times 5} = \frac{1}{6 \times 5} = \frac{1}{30}$
- (h) $\left(\frac{1}{2} - \frac{1}{3}\right)\left(\frac{3}{4} - \frac{4}{5}\right) \div \left(\frac{1}{2} - \frac{2}{5} + \frac{1}{7}\right) = \left(\frac{3-2}{6}\right)\left(\frac{15-16}{20}\right) \div \left(\frac{35-28+10}{70}\right)$
 $= \frac{1}{6} \times \left(-\frac{1}{20}\right) \div \left(\frac{17}{70}\right)$
 $= -\frac{1}{120} \div \frac{17}{70} = -\frac{1}{120} \times \frac{70}{17} = -\frac{7}{204}$
- (i) $\frac{5}{6} - \frac{3}{5}\left(\frac{1}{3} + \frac{2}{11}\right) = \frac{5}{6} - \frac{3}{5}\left(\frac{11+6}{33}\right) = \frac{5}{6} - \frac{3}{5} \times \frac{17}{33} = \frac{5}{6} - \frac{17}{55} = \frac{275-102}{330} = \frac{173}{330}$
- (j) $4\frac{2}{3} \div \left(3 - \frac{1}{2}\right) + \left(\frac{2}{5} \div 1\frac{1}{5}\right) = \frac{14}{3} \div \left(\frac{6-1}{2}\right) + \left(\frac{2}{5} \div \frac{6}{5}\right)$
 $= \frac{14}{3} \div \frac{5}{2} + \left(\frac{2}{5} \times \frac{5}{6}\right)$
 $= \left(\frac{14}{3} \times \frac{2}{5}\right) + \frac{10}{30}$
 $= \frac{28}{15} + \frac{10}{30} = \frac{56+10}{30} = \frac{66}{30} = \frac{11}{5} = 2\frac{1}{5}$
- (k) $\frac{1}{2}$ of $40 + 1\frac{3}{4}$ of $2\frac{2}{9} + 2\frac{1}{5} \times 0 = \frac{1}{2} \times 40 + \frac{7}{4} \times \frac{20}{9} + 0$
 $= 20 + \frac{7 \times 5}{9} + 0$
 $= 20 + \frac{35}{9} = \frac{180+35}{9} = \frac{215}{9} = 23\frac{8}{9}$
- (l) $\left(1 \div 2\frac{1}{5}\right) \div 2\frac{1}{5}$ of $2\frac{1}{2} - 2 = \left(1 \div \frac{11}{5}\right) \div \frac{11}{5}$ of $\frac{5}{2} - 2$
 $= 1 \times \frac{5}{11} \div \frac{11}{5} \times \frac{5}{2} - 2$
 $= \frac{5}{11} \times \frac{2}{11} - 2$
 $= \frac{10}{121} - 2 = \frac{10-242}{121} = \frac{-232}{121} = -1\frac{111}{121}$
- (m) $2\frac{6}{11}$ of $1\frac{2}{7} \div 2\frac{2}{11} = \frac{28}{11}$ of $\frac{9}{7} \div \frac{24}{11}$
 $= \frac{28}{11} \times \frac{9}{7} \times \frac{11}{24}$
 $= \frac{4 \times 9}{11} \times \frac{11}{24} = \frac{9}{6} = \frac{3}{2} = 1\frac{1}{2}$

Exercise 2.2

1. The cost of 1 litre of milk = ₹ $6\frac{2}{5}$ = ₹ $\frac{32}{5}$

∴ the cost of 5 litre of milk = ₹ $\frac{32}{5} \times 5$
= ₹ 32

Hence, the cost of 5 litre of milk is ₹ 32.

2. The cost of 1 m of cotton cloth = ₹ $25\frac{1}{5}$ = ₹ $\frac{126}{5}$

∴ the cost of $5\frac{5}{9}$ m or $\frac{50}{9}$ m of cotton cloth
= ₹ $\frac{126}{5} \times \frac{50}{9}$
= ₹ 14×10 = ₹ 140

Hence, the cost of $5\frac{5}{9}$ m of cotton cloth is ₹ 140.

3. In a day,

distance covered by a postman = $5\frac{3}{7}$ km = $\frac{38}{7}$ km

∴ in $4\frac{1}{2}$ days, distance covered by him = $\frac{9}{2} \times \frac{38}{7}$ km
= $\frac{9 \times 19}{7}$ km = $\frac{171}{7}$ km = $24\frac{3}{7}$ km

Hence, he will cover $24\frac{3}{7}$ km in $4\frac{1}{2}$ days.

4. The side of a square = $7\frac{1}{8}$ m = $\frac{57}{8}$ m

We know that,

The perimeter of a square = 4 side

∴ the perimeter of a square = $4 \times \frac{57}{8}$ m
= $\frac{57}{2}$ m = $28\frac{1}{2}$ m

Hence, the perimeter of a square is $28\frac{1}{2}$ m.

5. The side of a square = $4\frac{2}{7}$ m

We know that,

The area of a square = side²

∴ The area of a square = $\left(4\frac{2}{7}\text{ m}\right)^2$
= $\left(\frac{30}{7}\text{ m}\right)^2$

$$= \frac{900}{49} \text{ m}^2 = 18\frac{18}{49} \text{ m}^2$$

Hence, the area of a square is $18\frac{18}{49} \text{ m}^2$.

6. One tin of oil holds $= 4\frac{1}{5}$ litres

$$\begin{aligned} \therefore 15 \text{ such tins of oil holds} &= 15 \times 4\frac{1}{5} \\ &= 15 \times \frac{21}{5} \text{ litres} \\ &= 3 \times 21 \text{ litres} \\ &= 63 \text{ litres} \end{aligned}$$

Hence, 63 litres of oil can 15 such tins hold.

7. Length of each piece $= 6\frac{3}{4}$ m

Number of pieces = 8

$$\begin{aligned} \text{The original length of the iron rod} &= 6\frac{3}{4} \times 8 \text{ m} \\ &= \frac{27}{4} \times 8 \text{ m} = 27 \times 2 \text{ m} = 54 \text{ m} \end{aligned}$$

8. A water tank can hold $= 56\frac{1}{4}$ litres

$$\begin{aligned} \therefore \text{the capacity of water when it is } \frac{2}{5} \text{ full} &= \frac{2}{5} \times \frac{225}{4} \\ &= \frac{45}{2} \text{ litres} \\ &= 22\frac{1}{2} \text{ litres} \end{aligned}$$

Hence, $22\frac{1}{2}$ litres of water is contained in the tank when it is $\frac{2}{5}$ fully.

9. The length of a rectangular field $= 16\frac{1}{2}$ m

$$= \frac{33}{2} \text{ m}$$

The breadth of a rectangular field $= 12\frac{3}{4} \text{ m} = \frac{51}{4} \text{ m}$

$$\begin{aligned} \text{The perimeter of a rectangular field} &= 2 \left[\frac{33}{2} \text{ m} + \frac{51}{4} \text{ m} \right] \\ &= 2 \left[\frac{66 + 51}{4} \right] \text{ m} \\ &= \frac{117}{2} \text{ m} = 58\frac{1}{2} \text{ m} \end{aligned}$$

Hence, the perimeter of a rectangular field is $58\frac{1}{2}$ m.

10. The given,

$$\text{length} = 36\frac{3}{5} \text{ m} = \frac{183}{5} \text{ m}$$

$$\text{breadth} = 16\frac{2}{3} \text{ m} = \frac{50}{3} \text{ m}$$

$$\begin{aligned}\therefore \text{ the area of a rectangular park} &= \text{length} \times \text{breadth} \\ &= \frac{183}{5} \times \frac{50}{3} \text{ m}^2 \\ &= 61 \times 10 \text{ m}^2 \\ &= 610 \text{ m}^2\end{aligned}$$

Hence, the area of a rectangular park is 610 m^2 .

11. The cost of 10 kg of rice = ₹ $62\frac{1}{2}$

$$\begin{aligned}\therefore \text{ the cost of 1 kg of rice} &= ₹ \frac{125}{2} \div 10 \\ &= ₹ \frac{125}{2} \times \frac{1}{10} \\ &= ₹ \frac{125}{20} = ₹ \frac{25}{4} = ₹ 6\frac{1}{4}\end{aligned}$$

Hence, the cost of 1 kg of rice is ₹ $6\frac{1}{4}$.

12. The cost of 15 pens = ₹ $32\frac{1}{2}$ = ₹ $\frac{65}{2}$

$$\begin{aligned}\therefore \text{ the cost of 1 pen} &= ₹ \frac{65}{2} \div 15 \\ &= ₹ \frac{65}{2} \times \frac{1}{15} \\ &= ₹ \frac{13}{2} \times \frac{1}{3} = ₹ \frac{13}{6} \\ &= ₹ 2\frac{1}{6}\end{aligned}$$

Hence, the cost of 1 pen is ₹ $2\frac{1}{6}$.

13. The cost of 1 kg of sugar = ₹ $11\frac{1}{4}$ = ₹ $\frac{45}{4}$

$$\begin{aligned}\text{Sugar can be bought} &= ₹ 25\frac{5}{7} \div ₹ 11\frac{1}{4} \\ &= \left(\frac{180}{7} \div \frac{45}{4} \right) \text{ kg} \\ &= \frac{180 \times 4}{7 \times 45} \text{ kg} \\ &= \frac{4 \times 4}{7} \text{ kg}\end{aligned}$$

$$= \frac{16}{7} \text{ kg} = 2\frac{2}{7} \text{ kg}$$

Hence, $2\frac{2}{7}$ kg of sugar can be bought for ₹ $25\frac{5}{7}$.

14. In $2\frac{1}{4}$ hours, distance covered by a cyclist = $14\frac{2}{5}$ km = $\frac{72}{5}$ km

$$\therefore \text{ in an hour, distance covered by a cyclist} = \left(\frac{72}{5} \div \frac{9}{4}\right) \text{ km}$$

$$= \left(\frac{72}{5} \times \frac{4}{9}\right) \text{ km}$$

$$= \frac{8}{5} \times 4 \text{ km} = \frac{32}{5} \text{ km} = 6\frac{2}{5} \text{ km}$$

Hence, $6\frac{2}{5}$ km is the distance covered by the cyclist in an hour.

15. Length of the ribbon = $11\frac{1}{4}$ m = $\frac{45}{4}$ m

Numbers of pieces cut = 9

$$\therefore \text{ length of each piece} = \frac{45}{4} \text{ m} \div 9$$

$$= \frac{45}{4} \text{ m} \times \frac{1}{9}$$

$$= \frac{5}{4} \text{ m} = 1\frac{1}{4} \text{ m}$$

Hence, the length of each piece of the ribbon is $1\frac{1}{4}$ m.

16. Preeti had money = ₹ 65

The cost of each note book = ₹ $4\frac{1}{3}$

$$= ₹ \frac{13}{3}$$

Numbers of note book = ?

$$\text{Numbers of note book} = ₹ 65 \div ₹ \frac{13}{3}$$

$$= 65 \times \frac{3}{13} = 5 \times 3 = 15$$

Hence, 15 note books bought by her.

17. Product of two fractions = 16

$$\text{One of the fraction} = 3\frac{1}{7} = \frac{22}{7}$$

$$\text{Other fraction} = 16 \div \frac{22}{7}$$

$$= 16 \times \frac{7}{22} = \frac{56}{11} = 5\frac{1}{11}$$

Hence, the other fraction is $5\frac{1}{11}$.

18. Let the total number of students be x .

Then, number of girls $= \frac{3}{5} \times x = \frac{3x}{5}$

\therefore number of boys $= \left(x - \frac{3x}{5} \right) = \frac{5x - 3x}{5} = \frac{2x}{5}$

Given, number of boys $= 494$

\therefore $\frac{2x}{5}$ of the students $= 494$

\therefore $x = \frac{494 \times 5}{2}$

$x = 247 \times 5 = 1235$

\therefore total number of students $= 1235$

\therefore number of girls $= 1235 - 494 = 741$

Hence, there are 741 girls in the school.

19. Let the length of whole journey be x km.

Then, the length of journey left $= \frac{2}{5}$ of x km
 $= \frac{2x}{5}$ km

\therefore the length of journey covered $= \left(x - \frac{2x}{5} \right)$ km
 $= \left(\frac{5x - 2x}{5} \right)$ km $= \frac{3x}{5}$ km

Given, the length of the journey covered $= 33$ km

\therefore $\frac{3x}{5} = 33$ km

$x = \frac{33 \times 5}{3}$ km

$x = 11 \times 5$ km $= 55$ km

Hence, the length of the whole journey is 55 km.

20. Let the total number of pages of a book be x .

Then, the pages of a book left $= 80$

Number of pages read $= \frac{3}{5}x$

\therefore number of pages left $= \left(x - \frac{3x}{5} \right) = \left(\frac{5x - 3x}{5} \right) = \frac{2x}{5}$

Given, the pages of a book left $= 80$

\therefore $\frac{2x}{5} = 80$

$x = \frac{80 \times 5}{2} = 200$

Hence, there are 200 pages in the book.

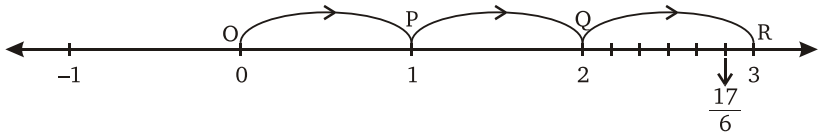
MCQs

1. (a) 2. (d) 3. (c) 4. (b) 5. (d)

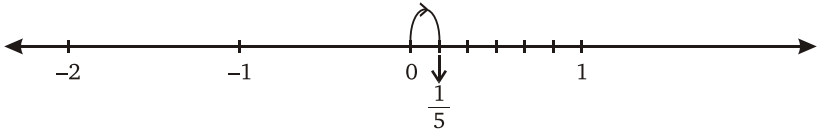


Exercise 3.1

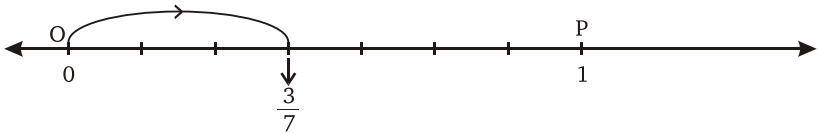
1. (a)



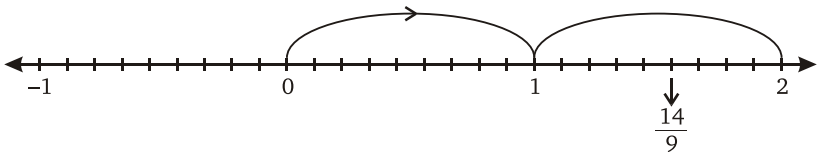
(b)



(c)



(d)



2. (a) $2 \longrightarrow \frac{2}{1}$

(b) $7 \longrightarrow \frac{7}{1}$

(c) $0 \longrightarrow \frac{0}{1}$

(d) $119 \longrightarrow \frac{119}{1}$

(e) $-25 \longrightarrow \frac{-25}{1}$

(f) $-113 \longrightarrow \frac{-113}{1}$

3. (a) $\frac{5}{6}$; Numerator = 5

(b) $-\frac{1}{4}$; Numerator = -1

Denominator = 6

Denominator = 4

(c) $\frac{18}{23}$; Numerator = 18

(d) $\frac{33}{-118}$; Numerator = 33

Denominator = 23

Denominator = -118

(e) $\frac{-15}{-122}$; Numerator = -15

Denominator = -122

4. (a) $\frac{-19}{33} = -\frac{19}{33}$ = Negative

(b) $\frac{-17}{-39} = \frac{17}{39}$ = Positive

(c) $\frac{37}{-45} = -\frac{37}{45}$ = Negative

(d) $\frac{-89}{-93} = \frac{89}{93}$ = Positive

5. As numerator of each rational number is negative, so, multiply the numerator and denominator of each rational number by -1 .

$$(a) \quad -\frac{1}{6} = \frac{-1 \times (-1)}{6 \times (-1)} = \frac{1}{-6}$$

$$(b) \quad \frac{-25}{-45} = \frac{-25 \times (-1)}{-45 \times (-1)} = \frac{25}{45}$$

$$(c) \quad -9 = \frac{-9 \times (-1)}{1 \times (-1)} = \frac{9}{-1}$$

$$(d) \quad \frac{-23}{-47} = \frac{-23 \times (-1)}{-47 \times (-1)} = \frac{23}{47}$$

6. As denominator of each rational number is negative, so multiply the numerator and denominator of each rational number by -1 .

$$(a) \quad \frac{2}{-9} = \frac{2 \times (-1)}{-9 \times (-1)} = \frac{-2}{9}$$

$$(b) \quad \frac{17}{-30} = \frac{17 \times (-1)}{-39 \times (-1)} = \frac{-17}{30}$$

$$(c) \quad \frac{-14}{-11} = \frac{-14 \times (-1)}{-11 \times (-1)} = \frac{14}{11}$$

$$(d) \quad \frac{-47}{-53} = \frac{-47 \times (-1)}{-53 \times (-1)} = \frac{47}{53}$$

7. (a) $\frac{-18}{39} = \frac{-6}{13} = -\frac{6}{13}$

1. The denominator is already positive.

2. HCF of 18 and 39 is 3. So, both numerator and denominator can be divided by 3.

$$(b) \quad \frac{5}{23} = \frac{5}{23}$$

1. The denominator is already positive.

2. HCF of 5 and 23 is 1. So, both numerator and denominator can be divided by 1.

$$(c) \quad \frac{7}{-28} = \frac{1}{-4} = -\frac{1}{4}$$

1. The denominator is negative, so it must be changed to a positive denominator.

2. HCF of 7 and 28 is 7. So, both numerator and denominator can be divided by 7.

$$(d) \quad \frac{-34}{-119} = \frac{2}{7}$$

1. $\frac{-34}{-119}$ can be written as $\frac{34}{119}$, so, that the denominator becomes positive.

2. Both 34 and 119 are divided by 17 as the HCF of 34 and 119 is 17.

8. (a) -4

$$= -\frac{4 \times 2}{1 \times 2} = \frac{-8}{2} \quad [\text{Multiplying both numerator and denominator by 2.}]$$

$$\frac{-4}{1} = \frac{-4 \times 3}{1 \times 3} = \frac{-12}{3} \quad [\text{Multiplying both numerator and denominator by 3.}]$$

$$\frac{-4}{1} = \frac{-4 \times 4}{1 \times 4} = \frac{-16}{4} \quad [\text{Multiplying both numerator and denominator by 4.}]$$

Hence, $\frac{-8}{2}$, $\frac{-12}{3}$ and $\frac{-16}{4}$ are equivalent fractions of -4 .

$$(b) \quad \frac{6}{-13} = \frac{6 \times 2}{-13 \times 2} = \frac{12}{-26} \quad [\text{Multiplying both numerator and denominator by 2.}]$$

$$\frac{6}{-13} = \frac{6 \times 3}{-13 \times 3} = \frac{18}{-39} \quad [\text{Multiplying both numerator and denominator by 3.}]$$

$$\frac{6}{-13} = \frac{6 \times 4}{-13 \times 4} = \frac{24}{-52} \quad [\text{Multiplying both numerator and denominator by 4.}]$$

Hence, $\frac{12}{-26}$, $\frac{18}{-39}$ and $\frac{24}{-52}$ are equivalent fractions of $\frac{6}{-13}$.

(c) $\frac{8}{17} = \frac{8 \times 2}{17 \times 2} = \frac{16}{34}$ [Multiplying both numerator and denominator by 2.]

$$\frac{8}{17} = \frac{8 \times 3}{17 \times 3} = \frac{24}{51} \quad [\text{Multiplying both numerator and denominator by 3.}]$$

$$\frac{8}{17} = \frac{8 \times 4}{17 \times 4} = \frac{32}{68} \quad [\text{Multiplying both numerator and denominator by 4.}]$$

Hence, $\frac{16}{34}$, $\frac{24}{51}$ and $\frac{32}{68}$ are equivalent fractions of $\frac{8}{17}$.

(d) $\frac{-19}{34} = \frac{-19 \times 2}{34 \times 2} = \frac{-38}{68}$ [Multiplying both numerator and denominator by 2.]

$$\frac{-19}{34} = \frac{-19 \times 3}{34 \times 3} = \frac{-57}{102} \quad [\text{Multiplying both numerator and denominator by 3.}]$$

$$\frac{-19}{34} = \frac{-19 \times 4}{34 \times 4} = \frac{-76}{136} \quad [\text{Multiplying both numerator and denominator by 4.}]$$

Hence, $\frac{-38}{68}$, $\frac{-57}{102}$ and $\frac{-76}{136}$ are equivalent fraction of $\frac{-19}{34}$.

9. The given rational numbers are :

(a) $\frac{4}{-6}$ and $\frac{12}{-18}$

By cross multiplication, we have

$$\begin{array}{cc} 4 & 12 \\ -6 & -18 \end{array}$$

$$4 \times (-18) = -72 \text{ and } -6 \times 12 = -72$$

Product are equal.

Thus, $\frac{4}{-6}$ and $\frac{12}{-18}$ are equivalent rational number.

(b) The given rational numbers are :

$\frac{-8}{11}$ and $\frac{-14}{23}$

By cross multiplication, we have

$$\begin{array}{cc} -8 & -14 \\ 11 & 23 \end{array}$$

$$-8 \times 23 = -184 \text{ and } -14 \times 11 = -154$$

Product are not equal.

Thus, $\frac{-8}{11}$ and $\frac{-14}{23}$ are not equivalent rational numbers.

(c) The given rational numbers are :

$\frac{-52}{-24}$ and $\frac{13}{6}$

By cross multiplication, we have

$$\frac{-52}{-24} \times \frac{13}{6}$$

$$-52 \times 6 = -312 \text{ and } -24 \times 13 = -312$$

Product are equal.

Thus, $\frac{-52}{-24}$ and $\frac{13}{6}$ are equivalent rational numbers.

(d) The given rational number are :

$$\frac{115}{120} \text{ and } \frac{-23}{-24}$$

By cross multiplication, we have

$$\frac{115}{120} \times \frac{-23}{-24}$$

$$115 \times -24 = -2760 \text{ and } 120 \times (-23) = -2760$$

Product are equal.

Thus, $\frac{115}{120}$ and $\frac{-23}{-24}$ are equivalent rational numbers.

10. (a) Equivalent rational number of $\frac{-36}{63}$ with numerator -4 can be obtained by dividing its numerator and denominator by 9.

$$\frac{-36 \div 9}{63 \div 9} = \frac{-4}{7}$$

So, the required rational number is $\frac{-4}{7}$ with numerator -4 .

$$(b) \frac{-36}{63} = \frac{-36 \div (-3)}{63 \div (-3)} = \frac{12}{-21}$$

1. Divide the numerator of the rational number by 12 to get -3 .

2. Divide the numerator and denominator by (-3) .

$$(c) \frac{-36}{63} = \frac{-36 \div (-9)}{63 \div (-9)} = \frac{+4}{-7} = \frac{4}{-7}$$

1. Divide the denominator of the rational number by -7 to get (-9) .

2. Divide the numerator and denominator by -9 .

$$(d) \frac{-36}{63} = \frac{-36 \div 2}{63 \div 2} = \frac{-18}{21}$$

1. Divide the denominator of the rational number by 21 to get 2.

2. Divide the denominator and numerator by 2.

$$11. (a) \frac{-15}{16} = \frac{-15 \times 7}{16 \times 7} = \frac{-105}{112}$$

1. Divide 105 by the denominator to get 7.

2. Multiply the numerator and denominator by 7.

$$(b) \frac{-15}{16} = \frac{-15 \times (-4)}{16 \times (-4)} = \frac{60}{-64}$$

1. Divide -60 by the numerator to get -4 .

2. Multiply the numerator and denominator by -4 .

$$(c) \frac{-15}{16} = \frac{-15 \times 3}{16 \times 3} = \frac{-45}{48}$$

1. Divide -48 by the denominator to get 3.

2. Multiply the numerator and denominator by 4.

$$(d) \frac{-15}{16} = \frac{-15 \times (-7)}{16 \times (-7)} = \frac{105}{-112}$$

1. Divide 112 by the denominator to get -7 .

2. Multiply the denominator and numerator by -7 .

$$12. (a) \frac{-9}{5} = \frac{-9 \times (-2)}{5 \times (-2)} = \frac{18}{-10}$$

$$\frac{-9}{5} = \frac{-9 \times (-4)}{5 \times (-4)} = \frac{36}{-20}$$

$$\frac{-9}{5} = \frac{-9 \times 5}{5 \times 5} = \frac{-45}{25}$$

$$\frac{-9}{5} = \frac{-9 \times (-6)}{5 \times (-6)} = \frac{54}{-30}$$

$$\text{Thus, } \frac{-9}{5} = \frac{18}{-10} = \frac{36}{-20} = \frac{-45}{25} = \frac{54}{-30}$$

$$13. (a) \frac{-2}{5} = \frac{4}{x}$$

$$\Rightarrow -2 \times x = 5 \times 4$$

$$\Rightarrow x = \frac{5 \times 4}{-2}$$

$$= \frac{-20}{2} = -10$$

$$(b) \frac{3}{-7} = \frac{x}{49}$$

$$\Rightarrow 3 \times 49 = -7x$$

$$\Rightarrow x = \frac{3 \times 49}{-7}$$

$$\Rightarrow x = 3 \times (-7)$$

$$\Rightarrow x = -21$$

$$(c) \frac{5}{16} = \frac{30}{x}$$

$$\Rightarrow 5 \times x = 16 \times 30$$

$$\Rightarrow x = \frac{16 \times 30}{5}$$

$$\Rightarrow x = 16 \times 6$$

$$\Rightarrow x = 96$$

$$(d) \frac{2}{-3} = \frac{x}{12}$$

$$\Rightarrow -3 \times x = 2 \times 12$$

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

$$\Rightarrow x = 2 \times (-4)$$

$$= -8$$

$$(e) \frac{x}{-17} = 4$$

$$\Rightarrow x = 4 \times (-17)$$

$$\Rightarrow x = -68$$

14. (a) A number which can be expressed in the form $\frac{p}{q}$, is called a **rational** number.

(b) Every rational number is the **quotient** of two integers such that denominator is non-zero **integer**.

(c) The system of rational numbers include all **integers** and **fractions**.

(d) Positive rational numbers are represented on the **right** of zero.

(e) If $\frac{p}{q}$ and $\frac{r}{s}$ are two equivalent rational numbers, then $p \times s = q \times r$

Exercise 3.2

1. (a) $|6| = 6$ (b) $\left| \frac{-5}{9} \right| = \frac{5}{9}$ (c) $\left| \frac{-6}{11} \right| = \frac{6}{11}$
 (d) $\left| \frac{23}{37} \right| = \frac{23}{37}$ (e) $|-39| = 39$ (f) $\left| \frac{-41}{-79} \right| = \left| \frac{41}{79} \right| = \frac{41}{79}$

2. (a) LCM of 7 and 11 is 77.

$$\text{Thus, } \frac{3}{7} = \frac{3 \times 11}{7 \times 11} = \frac{33}{77} \text{ and } \frac{5}{11} = \frac{5 \times 7}{11 \times 7} = \frac{35}{77}$$

Clearly, $33 < 35$

$$\text{So, } \frac{33}{77} < \frac{35}{77}$$

$$\text{or } \frac{3}{7} < \frac{5}{11}$$

- (b) The denominator of second rational number is negative, so it must be changed to a positive denominator.

$$\text{So, } -\frac{1}{2} \text{ and } \frac{-2}{1}$$

LCM of 2 and 1 is 2.

$$\text{Thus, } -\frac{1}{2} = \frac{-1 \times 1}{2 \times 1} = \frac{-1}{2} \text{ and } \frac{-2}{1} = \frac{-2 \times 2}{1 \times 2} = \frac{-4}{2}$$

Clearly, $-1 > -4$

$$\text{So, } \frac{-1}{2} > \frac{-4}{2}$$

$$\text{or } -\frac{1}{2} > -\frac{2}{1}$$

- (c) The denominator of second rational number is negative, so it must be changed to a positive denominator.

$$\text{Thus, } \frac{-11}{9}, \frac{-6}{5}$$

LCM of 9 and 5 is 45.

$$\text{Thus, } \frac{-11}{9} = \frac{-11 \times 5}{9 \times 5} = \frac{-55}{45} \text{ and } \frac{-6}{5} = \frac{-6 \times 9}{5 \times 9} = \frac{-54}{45}$$

Clearly, $-55 < -54$

$$\text{So, } \frac{-55}{45} < \frac{-54}{45}$$

$$\text{Or } \frac{-11}{9} < \frac{-6}{5}$$

- (d) The denominator of second rational number is negative, so it must be changed to a positive denominator.

$$\text{Thus, } \frac{-2}{7}, \frac{-9}{11}$$

LCM of 7 and 11 is 77.

$$\text{Thus, } \frac{-2}{7} = \frac{-2 \times 11}{7 \times 11} = \frac{-22}{77} \text{ and } \frac{-9}{11} = \frac{-9 \times 7}{11 \times 7} = \frac{-63}{77}$$

Clearly, $-22 > -63$

So, $\frac{-22}{77} > \frac{-63}{77}$

or, $\frac{-2}{7} > \frac{-9}{11}$

3. (a) $\frac{4}{11} \times \frac{8}{15}$

$4 \times 15, 11 \times 8$ [By cross multiplication]

60, 88

Since, $60 < 88$

So, $\frac{4}{11} < \frac{8}{15}$

(b) $\frac{0}{-1} \times \frac{2}{-1}$

$-1 \times 0, -2 \times 1$ [By cross multiplication]

0, -2

Since, $0 > -2$

So, $\frac{0}{-1} > \frac{2}{-1}$

(c) $\frac{-3}{7} \times \frac{-4}{10}$

$-3 \times 10, 7 \times (-4)$ [By cross multiplication]

-30, -28

Since, $-30 < -28$

So, $\frac{-3}{7} < \frac{-4}{10}$

(d) $\frac{18}{40} \times \frac{9}{20}$

$\Rightarrow 18 \times 20, 40 \times 9$ [By cross multiplication]

$\Rightarrow 360, 360$

Since, $360 = 360$

So, $\frac{18}{40} = \frac{9}{20}$

(e) $\frac{23}{25} \times \frac{-21}{27}$

$\Rightarrow 23 \times 27, 25 \times (-21)$

$\Rightarrow 621, -525$

Since, $621 > -525$

So, $\frac{23}{25} > \frac{-21}{27}$

4. Ascending order means to arrange the rational numbers in increasing order.

(a) $\frac{7}{9}, \frac{1}{8}, \frac{11}{12}$

LCM of 9, 8, 12 is 72.

Converting the given rational numbers as equivalent fractions, we have,

$$\frac{7}{9} = \frac{7 \times 8}{9 \times 8} = \frac{56}{72}; \quad \frac{1}{8} = \frac{1 \times 9}{8 \times 9} = \frac{9}{72}$$

$$\text{and } \frac{11}{12} = \frac{11 \times 6}{12 \times 6} = \frac{66}{72}$$

$$\text{or, } \frac{9}{72} < \frac{56}{72} < \frac{66}{72}$$

$$\text{Thus, } \frac{1}{8} < \frac{7}{9} < \frac{11}{12}$$

$$(b) \quad -\frac{4}{15}, \frac{5}{-7}, \frac{8}{38} \text{ or } \frac{-4}{15}, \frac{-5}{7}, \frac{8}{38}$$

LCM of 15, 7, 38 is 3990.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{-4}{15} = \frac{-4 \times 266}{15 \times 266} = \frac{-1064}{3990}, \quad \frac{-5}{7} = \frac{-5 \times 570}{7 \times 570} = \frac{-2850}{3990}$$

$$\text{and } \frac{8}{38} = \frac{8 \times 105}{38 \times 105} = \frac{840}{3990}$$

$$\text{Thus, } \frac{-2850}{3990} < \frac{-1064}{3990} < \frac{840}{3990}$$

$$\text{or, } \frac{-5}{7} < \frac{-4}{15} < \frac{8}{38}$$

$$(c) \quad \frac{3}{8}, \frac{4}{12}, \frac{-7}{16}, \frac{-2}{3}$$

LCM of 8, 12, 16 and 3 is 48.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{3}{8} = \frac{3 \times 6}{8 \times 6} = \frac{18}{48}, \quad \frac{4}{12} = \frac{4 \times 4}{12 \times 4} = \frac{16}{48},$$

$$\frac{-7}{16} = \frac{-7 \times 3}{16 \times 3} = \frac{-21}{48} \text{ and } \frac{-2}{3} = \frac{-2 \times 16}{3 \times 16} = \frac{-32}{48}$$

$$\text{Thus, } \frac{-32}{48} < \frac{-21}{48} < \frac{16}{48} < \frac{18}{48}$$

$$\text{or, } \frac{-2}{3} < \frac{-7}{16} < \frac{4}{12} < \frac{3}{8}$$

$$(d) \quad \frac{7}{8}, \frac{5}{6}, \frac{3}{4}, \frac{-1}{12}, \frac{-2}{3}$$

LCM of 8, 6, 4, 12 and 3 is 24.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{7}{8} = \frac{7}{8} \times \frac{3}{3} = \frac{21}{24}; \quad \frac{5}{6} = \frac{5 \times 4}{6 \times 4} = \frac{20}{24}$$

$$\frac{3}{4} = \frac{3 \times 6}{4 \times 6} = \frac{18}{24}, \quad \frac{-1}{12} = \frac{-1 \times 2}{12 \times 2} = \frac{-2}{24} \text{ and } \frac{-2}{3} = \frac{-2 \times 8}{3 \times 8} = \frac{-16}{24};$$

$$\text{Thus, } \frac{-16}{24} < \frac{-2}{24} < \frac{18}{24} < \frac{20}{24} < \frac{21}{24}$$

$$\text{or, } \frac{-2}{3} < \frac{-1}{12} < \frac{3}{4} < \frac{5}{6} < \frac{7}{8}$$

$$(e) \frac{-3}{2}, \frac{2}{-3}, \frac{-7}{5}, \frac{9}{-13} \text{ or } \frac{-3}{2}, \frac{-2}{3}, \frac{-7}{5}, \frac{-9}{13}$$

LCM of 2, 3, 5, and 13 is 390.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{-3}{2} = \frac{-3 \times 195}{2 \times 195} = \frac{-585}{390}; \frac{-2}{3} = \frac{-2 \times 130}{3 \times 130} = \frac{-260}{390};$$

$$\frac{-7}{5} = \frac{-7 \times 78}{5 \times 78} = \frac{-546}{390} \text{ and } \frac{-9}{13} = \frac{-9 \times 30}{13 \times 30} = \frac{-270}{390}$$

$$\text{Thus, } \frac{-585}{390} < \frac{-546}{390} < \frac{-270}{390} < \frac{-260}{390}$$

$$\text{or, } -\frac{3}{2} < -\frac{7}{5} < \frac{-9}{13} < \frac{-2}{3}$$

$$\text{or, } \frac{-3}{2} < \frac{-7}{5} < \frac{9}{-13} < \frac{2}{-3}$$

$$(f) \frac{-7}{-9}, \frac{11}{12}, \frac{-21}{-18}, \frac{5}{6} \text{ or } \frac{7}{9}, \frac{11}{12}, \frac{21}{18}, \frac{5}{6}$$

LCM of 9, 12, 18 and 6 is 36.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{7}{9} = \frac{7 \times 4}{9 \times 4} = \frac{28}{36}; \frac{11}{12} = \frac{11 \times 3}{12 \times 3} = \frac{33}{36}$$

$$\frac{21}{18} = \frac{21 \times 2}{18 \times 2} = \frac{42}{36} \text{ and } \frac{5}{6} = \frac{5 \times 6}{6 \times 6} = \frac{30}{36}$$

$$\text{Thus, } \frac{28}{36} < \frac{30}{36} < \frac{33}{36} < \frac{42}{36}$$

$$\text{or, } \frac{7}{9} < \frac{5}{6} < \frac{11}{12} < \frac{21}{18}$$

$$\text{or, } \frac{-7}{-9} < \frac{5}{6} < \frac{11}{12} < \frac{-21}{-18}$$

5. Descending order means to arrange the rational numbers in decreasing order.

$$(a) \frac{13}{17}, \frac{17}{18}, \frac{16}{17}$$

LCM of 17, 18, 17 is 306.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{13}{17} = \frac{13 \times 18}{17 \times 18} = \frac{234}{306}; \frac{17}{18} = \frac{17 \times 17}{18 \times 17} = \frac{289}{306}; \frac{16}{17} = \frac{16 \times 18}{17 \times 18} = \frac{288}{306}$$

$$\text{Thus, } \frac{289}{306} > \frac{288}{306} > \frac{234}{306}$$

$$\text{or, } \frac{17}{18} > \frac{16}{17} > \frac{13}{17}$$

$$(b) \frac{5}{22}, \frac{-12}{77}, \frac{7}{-77} \text{ or } \frac{5}{22}, \frac{-12}{77}, \frac{-7}{77}$$

LCM of 22, 77 and 77 is 154.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{5}{22} = \frac{5 \times 7}{22 \times 7} = \frac{35}{154}; \frac{-12}{77} = \frac{-12 \times 2}{77 \times 2} = \frac{-24}{154}; \frac{-7}{77} = \frac{-7 \times 2}{77 \times 2} = \frac{-14}{154}$$

$$\text{Thus, } \frac{35}{154} > \frac{-14}{154} > \frac{-24}{154}$$

$$\text{or, } \frac{5}{22} > \frac{-7}{77} > \frac{-12}{77}$$

$$\text{or, } \frac{5}{22} > \frac{7}{-77} > \frac{-12}{77}$$

$$(c) \frac{-13}{20}, \frac{6}{15}, \frac{7}{12}, \frac{-9}{10}, \frac{3}{5}$$

LCM of 20, 15, 12, 10 and 5 is 60.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{-13}{20} = \frac{-13 \times 3}{20 \times 3} = \frac{-39}{60}; \frac{6}{15} = \frac{6 \times 4}{15 \times 4} = \frac{24}{60}$$

$$\frac{7}{12} = \frac{7 \times 5}{12 \times 5} = \frac{35}{60}; \frac{-9}{10} = \frac{-9 \times 6}{10 \times 6} = \frac{-54}{60}$$

$$\frac{3}{5} = \frac{3 \times 12}{5 \times 12} = \frac{36}{60}$$

$$\text{Thus, } \frac{36}{60} > \frac{35}{60} > \frac{24}{60} > \frac{-39}{60} > \frac{-54}{60}$$

$$\text{or, } \frac{3}{5} > \frac{7}{12} > \frac{6}{15} > \frac{-13}{20} > \frac{-9}{10}$$

$$(d) \frac{-7}{-8}, \frac{-13}{-16}, \frac{5}{8}, \frac{3}{4}$$

$$\text{or, } \frac{7}{8}, \frac{13}{16}, \frac{5}{8}, \frac{3}{4}$$

LCM of 8, 16, 8 and 4 is 16.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{7}{8} = \frac{7 \times 2}{8 \times 2} = \frac{14}{16}; \frac{13}{16} = \frac{13 \times 1}{16 \times 1} = \frac{13}{16}$$

$$\frac{5}{8} = \frac{5 \times 2}{8 \times 2} = \frac{10}{16} \text{ and } \frac{3}{4} = \frac{3 \times 4}{4 \times 4} = \frac{12}{16}$$

$$\text{Thus, } \frac{14}{16} > \frac{13}{16} > \frac{12}{16} > \frac{10}{16}$$

$$\text{or, } \frac{7}{8} > \frac{13}{16} > \frac{3}{4} > \frac{5}{8}$$

$$(e) \frac{9}{10}, \frac{2}{5}, \frac{13}{15}, \frac{1}{6}, \frac{19}{30}$$

LCM of 10, 5, 15, 6 and 30 is 30.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{9}{10} = \frac{9 \times 3}{10 \times 3} = \frac{27}{30}; \frac{2}{5} = \frac{2 \times 6}{5 \times 6} = \frac{12}{30}$$

$$\frac{13}{15} = \frac{13 \times 2}{15 \times 2} = \frac{26}{30}; \frac{1}{6} = \frac{1 \times 5}{6 \times 5} = \frac{5}{30} \text{ and } \frac{19}{30} = \frac{19 \times 1}{30 \times 1} = \frac{19}{30}$$

$$\text{Thus, } \frac{27}{30} > \frac{26}{30} > \frac{19}{30} > \frac{12}{30} > \frac{5}{30}$$

$$\text{or, } \frac{9}{10} > \frac{13}{15} > \frac{19}{30} > \frac{2}{5} > \frac{1}{6}$$

$$(f) \frac{-5}{12}, \frac{-1}{24}, \frac{-11}{18}, \frac{-37}{36}$$

$$\text{or, } \frac{-5}{12}, \frac{-1}{24}, \frac{-11}{18}, \frac{-37}{36}$$

LCM of 12, 24, 18 and 36 is 72.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{-5}{12} = \frac{-5 \times 6}{12 \times 6} = \frac{-30}{72}; \frac{-1}{24} = \frac{-1 \times 3}{24 \times 3} = \frac{-3}{72}$$

$$\frac{-11}{18} = \frac{-11 \times 4}{18 \times 4} = \frac{-44}{72} \text{ and } \frac{-37}{36} = \frac{-37 \times 2}{36 \times 2} = \frac{-74}{72}$$

$$\text{Thus, } \frac{-3}{72} > \frac{-30}{72} > \frac{-37}{36} > \frac{-44}{72} > \frac{-74}{72}$$

$$\text{or, } \frac{-1}{24} > \frac{-5}{12} > \frac{-11}{18} > \frac{37}{-36}$$

6. The given rational numbers are :

$$\frac{47}{-48}, \frac{1}{6}, \frac{7}{-8}, \frac{15}{24}, \frac{-11}{12}$$

LCM of 48, 6, 8, 24 and 12 is 48.

Converting the given rational numbers as equivalent fractions, we have

$$\frac{-47}{48} = \frac{-47 \times 1}{48 \times 1} = \frac{-47}{48}; \frac{1}{6} = \frac{1 \times 8}{6 \times 8} = \frac{8}{48};$$

$$\frac{-7}{8} = \frac{-7 \times 6}{8 \times 6} = \frac{-42}{48}; \frac{15}{24} = \frac{15 \times 2}{24 \times 2} = \frac{30}{48}$$

$$\frac{-11}{12} = \frac{-11 \times 4}{12 \times 4} = \frac{-44}{48}$$

$$\text{The smallest rational number} = \frac{-47}{48}$$

$$\text{The greatest rational numbers} = \frac{15}{24}$$

7. (a) False (b) False (c) True

Exercise 3.3

$$1. (a) \frac{5}{3} + \frac{7}{3} = \frac{5+7}{3} = \frac{12}{3} = 4 \quad (b) \frac{-17}{23} + \frac{12}{23} = \frac{-17+12}{23} = -\frac{5}{23}$$

$$(c) \frac{6}{7} + \frac{5}{6} = \frac{6 \times 6 + 5 \times 7}{42} = \frac{36 + 35}{42} = \frac{71}{42} = 1\frac{29}{42}$$

$$(d) \frac{-5}{9} + \frac{-1}{4} = -\frac{5}{9} - \frac{1}{4} = \frac{-5 \times 4 - 1 \times 9}{36} = \frac{-20 - 9}{36} = \frac{-29}{36}$$

$$(e) \frac{-11}{13} + \frac{6}{5} = \frac{-11 \times 5 + 6 \times 13}{65} = \frac{-55 + 78}{65} = \frac{23}{65}$$

$$(f) \frac{-11}{8} + \left(\frac{7}{-5}\right) = -\frac{11}{8} - \frac{7}{5} = \frac{-11 \times 5 - 8 \times 7}{40} = \frac{-55 - 56}{40} = \frac{-111}{40}$$

2. (a) $\frac{4}{5} + \frac{7}{8} + \frac{3}{20} = \frac{4 \times 8 + 7 \times 5 + 3 \times 2}{40} = \frac{32 + 35 + 6}{40} = \frac{73}{40} = 1\frac{33}{40}$
- (b) $\frac{-9}{14} + \left(\frac{5}{-7}\right) + \frac{2}{3} = \frac{-9}{14} - \frac{5}{7} + \frac{2}{3} = \frac{-9 \times 3 - 5 \times 6 + 2 \times 14}{42} = \frac{-27 - 30 + 28}{42} = \frac{-29}{42}$
- (c) $\frac{1}{3} + \left(\frac{-5}{6}\right) + \frac{1}{15} = \frac{1}{3} - \frac{5}{6} + \frac{1}{15}$
 $= \frac{1 \times 10 - 5 \times 5 + 1 \times 2}{30} = \frac{10 - 25 + 2}{30} = \frac{12 - 25}{30} = \frac{-13}{30}$
- (d) $\frac{-5}{42} + \left(\frac{-3}{7}\right) + \left(\frac{1}{-21}\right) = -\frac{5}{42} - \frac{3}{7} - \frac{1}{21}$
 $= \frac{-5 \times 1 - 3 \times 6 - 1 \times 2}{42} = \frac{-5 - 18 - 2}{42} = \frac{-25}{42}$
- (e) $\frac{1}{8} + \frac{7}{12} + \left(\frac{-5}{9}\right) = \frac{1}{8} + \frac{7}{12} - \frac{5}{9} = \frac{1 \times 9 + 7 \times 6 - 5 \times 8}{72} = \frac{9 + 42 - 40}{72} = \frac{11}{72}$
- (f) $3\frac{1}{7} + \left(\frac{-5}{12}\right) + 2\frac{3}{4} = \frac{22}{7} - \frac{5}{12} + \frac{11}{4}$
 $= \frac{22 \times 12 - 5 \times 7 + 11 \times 21}{84} = \frac{264 - 35 + 231}{84} = \frac{460}{84} = \frac{115}{21}$

3. (a) Additive inverse of $\frac{5}{7}$ is $\frac{-5}{7}$. (b) Additive inverse of $\frac{7}{25}$ is $-\frac{7}{25}$.

(c) Additive invrse of $\frac{-9}{13}$ is $\frac{9}{13}$. (d) Additive inverse of $\frac{27}{-43}$ is $\frac{27}{43}$.

4. Let x be added to $\frac{-7}{41}$ to get 0.

$$x + \left(-\frac{7}{41}\right) = 0$$

$$x - \frac{7}{41} = 0$$

$$x = \frac{7}{41}$$

Hence, the required number is $4\frac{7}{41}$.

5. (a) **Zero** is the rational number whose additive inverse is the number itself.

(b) Additive inverse of $\frac{-5}{21}$ is $\frac{5}{21}$. (c) Additive inverse of 0 is 0.

(d) The value of $\frac{-12}{35} + \frac{12}{35}$ is 0. (e) The value of $0 + \frac{6}{21}$ is $\frac{6}{21}$.

Exercise 3.4

1. (a) $-\frac{7}{9} - \left(\frac{-4}{9}\right) = -\frac{7}{9} + \frac{4}{9} = \frac{-7 + 4}{9} = \frac{-3}{9}$

(b) $\frac{2}{15} - \frac{7}{15} = \frac{2-7}{15} = \frac{-5}{15}$

(c) $\frac{-11}{18} - \left(\frac{-5}{18}\right) = \frac{-11+5}{18} = \frac{-6}{18} = \frac{-1}{3}$

$$(d) -3 - \left(\frac{-18}{11}\right) = -3 + \frac{18}{11} = \frac{-3 \times 11 + 18}{11} = \frac{-33 + 18}{11} = -\frac{15}{11}$$

$$(e) \frac{-9}{10} - \frac{5}{8} = \frac{-9 \times 8 - 5 \times 10}{80} = \frac{-72 - 50}{80} = \frac{-122}{80} = \frac{-61}{40}$$

$$(f) \frac{-6}{11} - (-5) = \frac{-6}{11} + 5 = \frac{-6 + 5 \times 11}{11} = \frac{-6 + 55}{11} = \frac{49}{11} = 4 \frac{5}{11}$$

$$2. (a) \frac{-4}{9} + \frac{2}{3} + \frac{-1}{12} = \frac{-4}{9} + \frac{2}{3} - \frac{1}{12} = \frac{-4 \times 4 + 2 \times 12 - 1 \times 3}{36} = \frac{-16 + 24 - 3}{36} = \frac{5}{36}$$

$$(b) \frac{-1}{12} + \frac{3}{6} - 6 = -\frac{1}{12} + \frac{1}{2} - 6 = \frac{-1 + 1 \times 6 - 6 \times 12}{12} = \frac{-1 + 6 - 72}{12} = \frac{6 - 73}{12} = \frac{-67}{12}$$

$$(c) \frac{4}{10} - \frac{13}{15} + \frac{-9}{50} = \frac{4}{10} - \frac{13}{15} - \frac{9}{50} \\ = \frac{4 \times 15 - 13 \times 10 - 9 \times 3}{150} = \frac{60 - 130 - 27}{150} = \frac{60 - 157}{150} = -\frac{97}{150}$$

$$(d) \frac{-5}{6} - \frac{-1}{7} - \frac{-3}{21} = -\frac{5}{6} + \frac{1}{7} + \frac{3}{21} \\ = \frac{-5 \times 7 + 1 \times 6 + 3 \times 2}{42} \\ = \frac{-35 + 6 + 6}{42} = \frac{-35 + 12}{42} = -\frac{23}{42}$$

Exercise 3.5

$$1. (a) \frac{13}{15} \times \left(\frac{-1}{7}\right) = \frac{-13 \times 1}{15 \times 7} = \frac{-13}{105} \quad (b) \frac{-2}{7} \times \frac{21}{23} = \frac{-2 \times 21}{7 \times 23} = \frac{-42}{161} = \frac{-6}{23}$$

$$(c) \frac{-31}{19} \times \left(\frac{-5}{7}\right) = \frac{31 \times 5}{19 \times 7} = \frac{155}{133} \quad (d) \frac{17}{31} \times \left(\frac{-31}{17}\right) = \frac{-17}{31} \times \frac{31}{17} = -1$$

$$(e) \frac{-3}{24} \times \frac{12}{9} = \frac{-3 \times 12}{24 \times 9} = \frac{-1}{2 \times 3} = \frac{-1}{6}$$

$$(f) \frac{9}{35} \times \frac{-28}{33} = \frac{-9}{35} \times \frac{28}{33} = \frac{-3 \times 4}{5 \times 11} = \frac{-12}{55}$$

$$2. (a) \left(-\frac{1}{7} \times \frac{5}{6}\right) - \left(\frac{4}{21} \times \frac{-3}{8}\right) = \left(\frac{-1 \times 5}{7 \times 6}\right) - \left(\frac{-4 \times 3}{21 \times 8}\right) \\ = \frac{-5}{42} - \left(\frac{-1}{14}\right) = \frac{-5}{42} + \frac{1}{14} = \frac{-5 + 3}{42} = \frac{-2}{42} = \frac{-1}{21}$$

$$(b) \left(\frac{3}{4} \times \frac{8}{-9}\right) + \left(\frac{5}{6} \times \frac{3}{-4}\right) = \left(\frac{-1 \times 2}{1 \times 3}\right) + \left(\frac{-5}{2 \times 4}\right) \\ = \frac{-2}{3} - \frac{5}{8} = \frac{-2 \times 8 - 5 \times 3}{24} = \frac{-16 - 15}{24} = \frac{-31}{24}$$

$$(c) \left(\frac{65}{15} \times \frac{6}{13}\right) - \left(\frac{-1}{5} \times \frac{2}{1}\right) = \left(\frac{5 \times 6}{15}\right) - \left(\frac{-2}{5}\right) \\ = \left(\frac{6}{3}\right) - \left(\frac{-2}{5}\right) = 2 + \frac{2}{5} = \frac{2 \times 5 + 2}{5} = \frac{10 + 2}{5} = \frac{12}{5} = 2 \frac{2}{5}$$

$$(d) \left(\frac{9}{13} \times \frac{52}{15}\right) + \left(\frac{-3}{5} \times \frac{7}{1}\right) = \left(\frac{3 \times 4}{1 \times 5}\right) + \left(\frac{-3}{5} \times \frac{7}{1}\right) = \frac{12}{5} - \frac{21}{5} = \frac{12-21}{5} = -\frac{9}{5}$$

3. (a) $\left(\frac{3}{4} + \frac{8}{-9}\right) \times \left(\frac{5}{6} + \frac{3}{-4}\right) = \left(\frac{3}{4} - \frac{8}{9}\right) \times \left(\frac{5}{6} - \frac{3}{4}\right)$

$$= \left(\frac{3 \times 9 - 8 \times 4}{36}\right) \times \left(\frac{5 \times 4 - 3 \times 6}{24}\right)$$

$$= \left(\frac{27-32}{36}\right) \times \left(\frac{20-18}{24}\right) = \frac{-5}{36} \times \frac{2}{24} = \frac{-5}{36 \times 12} = \frac{-5}{432}$$

(b) $\left(\frac{-4}{9} + \frac{2}{3}\right) \times \left(\frac{11}{14} - \frac{2}{7}\right) = \left(\frac{-4+2 \times 3}{9}\right) \times \left(\frac{11-2 \times 2}{14}\right)$

$$= \left(\frac{-4+6}{9}\right) \times \left(\frac{11-4}{14}\right) = \frac{2}{9} \times \frac{7}{14} = \frac{7}{9 \times 7} = \frac{1}{9}$$

(c) $\left(\frac{2}{5} - \frac{1}{10} + \frac{7}{15}\right) \times \left(\frac{1}{12} - \frac{9}{16} + \frac{4}{8}\right)$

$$= \left(\frac{2 \times 6 - 1 \times 3 + 7 \times 2}{30}\right) \times \left(\frac{1 \times 4 - 9 \times 3 + 4 \times 6}{48}\right)$$

$$= \left(\frac{12-3+14}{30}\right) \times \left(\frac{4-27+24}{48}\right) = \frac{23}{30} \times \frac{1}{48} = \frac{23}{1440}$$

(d) $\left(-\frac{5}{6} + \frac{-3}{24}\right) \times \left(\frac{3}{8} + \frac{1}{4} - \frac{7}{6}\right) = \left(\frac{-5 \times 4 - 3}{24}\right) \times \left(\frac{3 \times 3 + 1 \times 6 - 7 \times 4}{24}\right)$

$$= \left(\frac{-20-3}{24}\right) \times \left(\frac{9+6-28}{24}\right) = \frac{-23}{24} \times \left(\frac{-13}{24}\right) = \frac{299}{576}$$

Exercise 3.6

1. (a) The reciprocal of $\frac{6}{19}$ is $\frac{19}{6}$. (b) The reciprocal of $\frac{-3}{28}$ is $\frac{-28}{3}$.
- (c) The reciprocal of -1 is -1 . (d) The reciprocal of -11 is $-\frac{1}{11}$.
- (e) The reciprocal of $\frac{7}{27}$ is $\frac{27}{7}$. (f) The reciprocal of 0 is 0 .
- (g) The reciprocal of $\frac{4}{13} \times \frac{13}{16}$ is $\frac{4}{1}$. (h) The reciprocal of $-\frac{1}{7} \times (-3)$ is $\frac{7}{3}$.

2. The given,

$$x = \frac{1}{3} \text{ and } y = \frac{2}{5}$$

$$(x + y)^{-1} \neq x^{-1} + y^{-1}$$

$$\text{LHS} = (x + y)^{-1} = \left(\frac{1}{3} + \frac{2}{5}\right)^{-1} = \left(\frac{5+6}{15}\right)^{-1} = \left(\frac{11}{15}\right)^{-1} = \frac{15}{11}$$

$$\text{RHS} = x^{-1} + y^{-1} = \left(\frac{1}{3}\right)^{-1} + \left(\frac{2}{5}\right)^{-1} = \left(\frac{3}{1}\right) + \frac{5}{2} = \frac{6+5}{2} = \frac{11}{2}$$

Hence, proved, LHS \neq RHS

3. The given,

$$x = \frac{2}{3} \text{ and } y = \frac{7}{9}$$

$$(x - y)^{-1} \neq x^{-1} - y^{-1}$$

$$\text{LHS} = (x - y)^{-1} = \left(\frac{2}{3} - \frac{7}{9}\right)^{-1} = \left(\frac{6-7}{9}\right)^{-1} = \left(-\frac{1}{9}\right)^{-1} = -\frac{9}{1} = -9$$

$$\text{RHS} = x^{-1} - y^{-1} = \left(\frac{2}{3}\right)^{-1} - \left(\frac{7}{9}\right)^{-1} = \frac{3}{2} - \frac{9}{7} = \frac{21-18}{14} = \frac{3}{14}$$

Hence, proved, LHS \neq RHS

4. The given,

$$x = \frac{4}{9} \text{ and } y = \frac{5}{17}$$

$$(x \times y)^{-1} = x^{-1} \times y^{-1}$$

$$\text{LHS} = (x \times y)^{-1} = \left(\frac{4}{9} \times \frac{5}{17}\right)^{-1} = \left(\frac{20}{153}\right)^{-1} = \frac{153}{20} = 7\frac{13}{20}$$

$$\text{RHS} = x^{-1} \times y^{-1} = \left(\frac{4}{9}\right)^{-1} \times \left(\frac{5}{17}\right)^{-1} = \left(\frac{9}{4}\right) \times \left(\frac{17}{5}\right) = \frac{153}{20} = 7\frac{13}{20}$$

Hence proved, LHS = RHS

5. Since, the reciprocal of $\frac{1}{11}$ is $\frac{11}{1}$. \therefore product = $\frac{7}{23} \times \frac{11}{1} = \frac{77}{23}$

6. Since, the reciprocal of $\frac{9}{22}$ is $\frac{22}{9}$. \therefore product = $\frac{9}{22} \times \frac{22}{9} = 1$

7. (a) False (b) False (c) False (d) True

Exercise 3.7

1. (a) $\frac{15}{17} \div \frac{-5}{17} = \frac{15}{17} \times \frac{17}{-5} = -\frac{15}{5} = -3$ (b) $\frac{-2}{33} \div \frac{1}{22} = \frac{-2}{33} \times \frac{22}{1} = \frac{-2 \times 2}{3} = \frac{-4}{3}$

(c) $\frac{-6}{7}$ by $-15 = -\frac{6}{7} \div -15 = -\frac{6}{7} \times -\frac{1}{15} = \frac{6}{105}$

2. (a) $\frac{5}{8} \div \frac{7}{10} = \frac{5}{8} \times \frac{10}{7} = \frac{5 \times 5}{4 \times 7} = \frac{25}{28}$ (b) $\frac{8}{9} \div \left(\frac{-4}{-5}\right) = \frac{8}{9} \times \frac{5}{4} = \frac{2 \times 5}{9} = \frac{10}{9}$

(c) $\frac{-3}{5} \div \frac{4}{35} = \frac{-3}{5} \times \frac{35}{4} = \frac{-3 \times 7}{4} = \frac{-21}{4}$

(d) $\frac{-16}{13} \div \left[\frac{-4}{7}\right] = +\frac{16}{13} \times \left(\frac{7}{4}\right) = \frac{16 \times 7}{13 \times 4} = \frac{4 \times 7}{13} = \frac{28}{13}$

(e) $\frac{-9}{22} \div (-18) = +\frac{9}{22} \times \frac{1}{18} = \frac{1 \times 1}{22 \times 2} = \frac{1}{44}$

(f) $\frac{21}{36} \div \frac{-30}{44} = -\frac{21}{36} \times \frac{44}{30} = -\frac{21 \times 22}{18 \times 30} = \frac{-7 \times 11}{18 \times 5} = \frac{-77}{90}$

3. (a) $x = \frac{6}{7}, y = \frac{-35}{36}$

$$(x \div y)^{-1} = x^{-1} \div y^{-1}$$

$$\text{LHS} = (x \div y)^{-1} = \left(\frac{6}{7} \div \frac{-35}{36}\right)^{-1} = \left(\frac{6}{7} \times \frac{-36}{35}\right)^{-1} = \left(-\frac{216}{245}\right)^{-1} = \frac{-245}{216}$$

Hence proved, LHS = RHS

$$(b) \quad x = \frac{-3}{11}, y = \frac{22}{39}$$

$$(x \div y)^{-1} = x^{-1} \div y^{-1}$$

$$\begin{aligned} \text{LHS} &= (x \div y)^{-1} = \left(\frac{-3}{11} \div \frac{22}{39}\right)^{-1} \\ &= \left(-\frac{3}{11} \times \frac{39}{22}\right)^{-1} = \left(\frac{-117}{242}\right)^{-1} = \frac{-242}{117} \end{aligned}$$

$$\begin{aligned} \text{RHS} &= x^{-1} \div y^{-1} = \left(\frac{-3}{11}\right)^{-1} \div \left(\frac{22}{39}\right)^{-1} \\ &= -\frac{11}{3} \div \frac{39}{22} = -\frac{11}{3} \times \frac{22}{39} = \frac{-242}{117} \end{aligned}$$

$$\begin{aligned} 4. (a) \quad \frac{2}{21} \div x &= \frac{-28}{63} \\ \frac{2}{21} \times \frac{1}{x} &= \frac{-28}{63} \\ x &= -\frac{2}{21} \times \frac{63}{28} \\ x &= \frac{-2 \times 3}{28} = \frac{-3}{14} \end{aligned}$$

$$\begin{aligned} (b) \quad x \div \frac{9}{13} &= \frac{1}{2} \\ x \times \frac{13}{9} &= \frac{1}{2} \\ x &= \frac{1}{2} \times \frac{9}{13} \\ x &= \frac{9}{26} \end{aligned}$$

$$\begin{aligned} (c) \quad -8 \div x &= \frac{32}{11} \\ -8 \times \frac{1}{x} &= 32 \\ \frac{-8}{x} &= \frac{32}{11} \\ x &= \frac{-8 \times 11}{32} \\ x &= \frac{-11}{4} \end{aligned}$$

$$(d) \quad \frac{1}{6} \div \frac{5}{24} = x$$

$$\frac{1}{6} \times \frac{24}{5} = x$$

$$x = \frac{4}{5}$$

Exercise 3.8

1. By long division method.

(a) $\frac{13}{5}$

$$\begin{array}{r} 5 \overline{) 13} \quad (2.6 \\ \underline{-10} \\ 30 \\ \underline{-30} \\ \times \end{array}$$

$\therefore \frac{13}{5} = 2.6$

(b) $\frac{5}{8}$

$$\begin{array}{r} 8 \overline{) 50} \quad (0.625 \\ \underline{-48} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-40} \\ \times \end{array}$$

(c) $\frac{9}{10}$

$$\begin{array}{r} 10 \overline{) 90} \quad (0.9 \\ \underline{-90} \\ \times \end{array}$$

$\therefore \frac{9}{10} = 0.9$

$\therefore \frac{5}{8} = 0.625$

(d) $3\frac{3}{5} = \frac{18}{5}$

$$\begin{array}{r} 5 \overline{) 18} \quad (3.6 \\ \underline{-15} \\ 30 \\ \underline{-30} \\ \times \end{array}$$

$\therefore \frac{18}{5} = 3.6$

(e) $3\frac{5}{16} = \frac{53}{16}$

$$\begin{array}{r} 16 \overline{) 53} \quad (3.3125 \\ \underline{-48} \\ 50 \\ \underline{-48} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-32} \\ 80 \\ \underline{-80} \\ \times \end{array}$$

$\therefore \frac{53}{16} = 3.3125$

2. By long division method

(a) $1\frac{2}{3} = \frac{5}{3}$

$$\begin{array}{r} 3 \overline{) 5} \quad (1.6 \\ \underline{-3} \\ 20 \\ \underline{-18} \\ 2 \end{array}$$

$\therefore \frac{5}{3} = 1.6$

(b) $\frac{3}{7}$

$$\begin{array}{r} 7 \overline{) 30} \quad (0.428571 \\ \underline{-28} \\ 20 \\ \underline{-14} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-35} \\ 50 \\ \underline{-49} \\ 10 \\ \underline{-7} \\ 3 \end{array}$$

$\therefore \frac{3}{7} = 0.428571$

$$(c) \frac{-4}{11} \therefore \frac{4}{11} \quad \begin{array}{r} 11 \overline{) 40} \text{ (0.363} \\ -33 \\ \hline 70 \\ -66 \\ \hline 40 \\ -33 \\ \hline 7 \end{array} \quad (d) \quad 7\frac{1}{12} = \frac{85}{12} \quad \begin{array}{r} 12 \overline{) 85} \text{ (7.083} \\ -84 \\ \hline 100 \\ -96 \\ \hline 40 \\ -36 \\ \hline 4 \end{array}$$

Negative of
 $\frac{-4}{11} = \frac{4}{11}$

Since, $\frac{4}{11} = 0.36$

$$\therefore \frac{-4}{11} = -0.36$$

$$(e) \quad 2\frac{4}{15} = \frac{34}{15} \quad \begin{array}{r} 15 \overline{) 34} \text{ (2.26} \\ -30 \\ \hline 40 \\ -30 \\ \hline 100 \\ -90 \\ \hline 10 \end{array}$$

$$\therefore \frac{34}{15} = 2.26$$

3. $\frac{17}{32}$, $\frac{91}{125}$ and $\frac{61}{64}$ are terminating decimals, because these rational numbers are in its lowest terms and its denominators have no factors other than 2 or 5.

4. $\frac{23}{27}$, $\frac{62}{63}$ and $\frac{69}{73}$ are non-terminating decimals, because these rational numbers are in its lowest terms and its denominators have factor other than 2 and 5.

5. (a) $0.36 = \frac{36}{100} = \frac{9}{25}$ (b) $6.25 = \frac{625}{100} = \frac{25}{4}$ (c) $0.025 = \frac{25}{1000} = \frac{1}{40}$

(d) $0.72 = \frac{72}{100} = \frac{18}{25}$ (e) $7.305 = \frac{7305}{1000} = \frac{1461}{200}$

6. (a) $28.34 \times 14.6 = \frac{2834}{100} \times \frac{146}{10} = \frac{1417}{50} \times \frac{73}{5} = \frac{103441}{250}$

$$(b) \quad 653.2 - (65.32 - 6.532) = \frac{6532}{10} - \left(\frac{6532}{100} - \frac{6532}{1000} \right)$$

$$= \frac{6532}{10} - 6532 \left[\frac{1}{100} - \frac{1}{1000} \right]$$

$$= \frac{6532}{10} - 6532 \left[\frac{10-1}{1000} \right]$$

$$= \frac{6532}{10} - \frac{6532 \times 9}{1000}$$

$$= \frac{653200 - 58788}{1000} = \frac{594412}{1000} = \frac{148603}{250}$$

$$(c) \quad 0.8 \times 0.008 \times 0.0008 = \frac{8}{10} \times \frac{8}{1000} \times \frac{8}{10000}$$

$$= \frac{4}{5} \times \frac{4}{500} \times \frac{4}{5000} = \frac{64}{12500000} = \frac{4}{781250} = \frac{2}{390625}$$

$$\begin{aligned}
 \text{(d) } 17.36 - 3.255 + 31.4 &= \frac{1736}{100} - \frac{3255}{1000} + \frac{314}{10} \\
 &= \frac{868}{50} - \frac{651}{200} + \frac{157}{5} \\
 &= \frac{434}{25} - \frac{651}{200} + \frac{157}{5} \\
 &= \frac{3472 - 651 + 6280}{200} = \frac{9752 - 651}{200} = \frac{9101}{200}
 \end{aligned}$$

$$\begin{aligned}
 \text{(e) } (6.25 \div 0.25) - (17.2 - 8.97) &= \left(\frac{625}{100} \div \frac{25}{100} \right) - (17.2 - 8.97) \\
 &= \left(\frac{625}{100} \times \frac{100}{25} \right) - \left(\frac{172}{10} - \frac{897}{100} \right) \\
 &= \frac{625}{25} - \left[\frac{1720 - 897}{100} \right] \\
 &= 25 - \frac{823}{100} \\
 &= \frac{2500 - 823}{100} = \frac{1677}{100}
 \end{aligned}$$

7. (a) False (b) True (c) False (d) False

Exercise 3.9

1. The sum of two numbers = 4

$$\text{One number} = \frac{-5}{7}$$

$$\text{Other number} = ?$$

So, other number = $4 - \left(\frac{-5}{7} \right)$

$$= 4 + \frac{5}{7} = \frac{28 + 5}{7} = \frac{33}{7}$$

Hence, the other number is $\frac{33}{7}$.

2. The sum of two rational numbers = $\frac{4}{7}$

$$\text{One number} = \frac{2}{35}$$

$$\text{Other number} = ?$$

So, other number = $\frac{4}{7} - \frac{2}{35} = \frac{4 \times 5 - 2}{35} = \frac{20 - 2}{35} = \frac{18}{35}$

Hence, the other number is $\frac{18}{35}$.

3. Let x be added to $\frac{-7}{9}$ to get -5 .

So, $x + \left(\frac{-7}{9} \right) = -5$

$$x = -5 + \frac{7}{9}$$

$$x = \frac{-5 \times 9 + 7}{9} = \frac{-45 + 7}{9} = \frac{-38}{9}$$

4. Let x be added to $\left[\frac{-2}{9} + \frac{1}{3}\right]$ to get $\frac{1}{6}$.

$$x + \left[\frac{-2}{9} + \frac{1}{3}\right] = \frac{1}{6}$$

$$x + \left[\frac{-2+3}{9}\right] = \frac{1}{6}$$

$$x + \frac{1}{9} = \frac{1}{6}$$

\Rightarrow

$$x = \frac{1}{6} - \frac{1}{9} = \frac{3-2}{18} = \frac{1}{18}$$

Hence, the required number is $\frac{1}{18}$.

5. Sum of two rational numbers = $\frac{-9}{13}$

$$\text{One number} = \frac{-23}{26}$$

Other number = ?

So, other number = $-\frac{9}{13} - \left(-\frac{23}{26}\right)$

$$= \frac{-9}{13} + \frac{23}{26}$$

$$= \frac{-9 \times 2 + 23}{26} = \frac{-18 + 23}{26} = \frac{5}{26}$$

Hence, the other number is $\frac{5}{26}$.

6. According to the questions

$$\left[\frac{-1}{5} - \frac{2}{5}\right] - \left[-\frac{1}{5} + \frac{2}{5}\right] = \left[\frac{-1-2}{5}\right] - \left[\frac{-1+2}{5}\right]$$

$$= \frac{-3}{5} - \frac{1}{5} = \frac{-3-1}{5} = \frac{-4}{5}$$

7. The product of two numbers = $\frac{-14}{27}$

$$\text{One number} = \frac{-7}{9}$$

Other number = ?

So, other number = $\frac{-14}{27} \div \left(\frac{-7}{9}\right) = \frac{-14}{27} \times \frac{-9}{7}$

$$= \frac{14 \times 9}{27 \times 7} = \frac{2 \times 1}{3 \times 1} = \frac{2}{3}$$

Hence, the required other number is $\frac{2}{3}$.

8. Since, the reciprocals of $\frac{7}{18}$ and $\frac{-12}{21}$ is $\frac{18}{7}$ and $\frac{-21}{12}$.

$$\begin{aligned}\text{So, the product of given reciprocals} &= \frac{18}{7} \times \left(\frac{-21}{12}\right) \\ &= -\frac{18}{7} \times \frac{21}{12} \\ &= \frac{-3 \times 3}{2} = -\frac{9}{2}\end{aligned}$$

9. Let x be multiplied to $\frac{-6}{11}$ to get 12.

$$\begin{aligned}\text{So,} \quad x \times \frac{-6}{11} &= 12 \\ x &= -\frac{12 \times 11}{6} \\ x &= -2 \times 11 \\ x &= -22\end{aligned}$$

Hence, the required number is -22 .

10. Let x be multiplied to $\frac{-7}{19}$ to get $\frac{1}{7}$.

$$\begin{aligned}\text{So,} \quad x \times \left(\frac{-7}{19}\right) &= \frac{1}{7} \\ x &= \frac{1}{7} \times \left(-\frac{19}{7}\right) \\ x &= \frac{-19}{49}\end{aligned}$$

Hence, the required number is $\frac{-19}{49}$.

11. Let $\frac{-33}{8}$ be divided by x to get $-\frac{11}{2}$.

$$\begin{aligned}\text{So,} \quad \frac{-33}{8} \div x &= -\frac{11}{2} \\ \frac{-33}{8} \times \frac{1}{x} &= -\frac{11}{2} \\ x &= +\frac{33 \times 2}{8 \times 11} = \frac{3}{4}\end{aligned}$$

Hence, the required number is $\frac{3}{4}$.

12. $\left[\frac{7}{18} + \frac{5}{9}\right] \div \left[\frac{5}{9} - \frac{7}{18}\right] = \left[\frac{7+10}{18}\right] \div \left[\frac{10-7}{18}\right] = \frac{17}{18} \div \frac{3}{18} = \frac{17}{18} \times \frac{18}{3} = \frac{17}{3}$

13. $\left[\frac{2}{3} - \frac{11}{18}\right] \div \left[\frac{1}{10} \times \frac{5}{6}\right] = \left[\frac{12-11}{18}\right] \div \left[\frac{5}{60}\right] = \frac{1}{18} \times \frac{60}{5} = \frac{12}{18} = \frac{2}{3}$

$$\begin{aligned}
 14. \quad \left[\frac{3}{4} + \frac{7}{10} \right] \div \left[\frac{11}{12} \times \frac{2}{5} \right] &= \left[\frac{15+14}{20} \right] \div \left[\frac{11}{30} \right] \\
 &= \frac{29}{20} \div \frac{11}{30} \\
 &= \frac{29}{20} \times \frac{30}{11} = \frac{29 \times 3}{2 \times 11} = \frac{87}{22} = 3 \frac{21}{22}
 \end{aligned}$$

MCQs

- | | | | |
|--------|--------|--------|--------|
| 1. (c) | 2. (d) | 3. (d) | 4. (b) |
| 5. (b) | 6. (d) | 7. (b) | 8. (d) |

4

Decimals

Exercise 4.1

- | | |
|---------------------|---|
| 1. (a) <u>28.74</u> | The place value of the under line digit is 8. |
| (b) <u>21.49</u> | The place value of the under line digit is $\frac{4}{10}$. |
| (c) <u>23.025</u> | The place value of the under line digit is $\frac{5}{1000}$. |
| (d) <u>98.753</u> | The place value of the under line digit is $\frac{3}{1000}$. |
| (e) <u>884.29</u> | The place value of the under line digit is $\frac{9}{100}$. |

2. Expanded form

- (a) $62.32 = 6 \times 10 + 2 \times 1 + \frac{1}{10} \times 3 + \frac{1}{100} \times 2$
- (b) $197.69 = 1 \times 100 + 9 \times 10 + 7 \times 1 + \frac{1}{10} \times 6 + \frac{1}{100} \times 9$
- (c) $343.95 = 3 \times 100 + 4 \times 10 + 3 \times 1 + \frac{1}{10} \times 9 + \frac{1}{100} \times 5$
- (d) $103.049 = 1 \times 100 + 0 \times 10 + 3 \times 1 + \frac{1}{10} \times 0 + \frac{1}{100} \times 4 + \frac{1}{1000} \times 9$
- (e) $804.254 = 8 \times 100 + 0 \times 10 + 4 \times 1 + \frac{1}{10} \times 2 + \frac{1}{100} \times 5 + \frac{1}{1000} \times 4$

3. (a) $8.54 + 28.642$

$$\begin{array}{r}
 8.54 \\
 + 28.642 \\
 \hline
 37.182
 \end{array}$$

(b) $40.47 + 24.642$

$$\begin{array}{r}
 40.470 \\
 + 24.642 \\
 \hline
 65.112
 \end{array}$$

(c) $2.49 + 39.057$

$$\begin{array}{r}
 2.490 \\
 + 39.057 \\
 \hline
 41.547
 \end{array}$$

(d) $27.34 + 71.36$

$$\begin{array}{r}
 27.34 \\
 + 71.36 \\
 \hline
 98.70
 \end{array}$$

$$\begin{array}{r} \text{(e) } 0.92 + 2.457 \\ 0.920 \\ + 2.457 \\ \hline 3.377 \end{array}$$

$$\begin{array}{r} \text{4. (a) } 25.75 - 22.92 \\ 25.75 \\ - 22.92 \\ \hline 2.83 \end{array}$$

$$\begin{array}{r} \text{(c) } 23.75 - 7.82 \\ 23.75 \\ - 7.82 \\ \hline 15.93 \end{array}$$

$$\begin{array}{r} \text{(e) } 437.09 - 100.57 \\ 437.09 \\ - 100.57 \\ \hline 336.52 \end{array}$$

$$\begin{array}{r} \text{(f) } 465.128 + 412.913 \\ 465.128 \\ + 412.913 \\ \hline 878.041 \end{array}$$

$$\begin{array}{r} \text{(b) } 94.20 - 78.02 \\ 94.20 \\ - 78.02 \\ \hline 16.18 \end{array}$$

$$\begin{array}{r} \text{(d) } 34.82 - 14.84 \\ 34.82 \\ - 14.84 \\ \hline 19.98 \end{array}$$

$$\begin{array}{r} \text{(f) } 536.9 - 134.09 \\ 536.90 \\ - 134.09 \\ \hline 402.81 \end{array}$$

5. Total weight of fruits bought by Meenakshi = 7 kg 400 g + 4 kg 500 g = 11 kg 900 g

$$\begin{array}{r} \text{kg} \quad \text{g} \\ 7 \quad 400 \\ + 4 \quad 500 \\ \hline 11 \quad 900 \end{array}$$

Similarly,
Total weight of fruits bought by Sonakshi = 5 kg 300 g + 6 kg 250 g = 11 kg 550 g

$$\begin{array}{r} \text{kg} \quad \text{g} \\ 5 \quad 300 \\ + 6 \quad 250 \\ \hline 11 \quad 550 \end{array}$$

Since, 11 kg 900 g > 11 kg 550 g
So, Meenakshi bought more fruits.
Difference = 11 kg 900 g - 11 kg 550 g = 350 g

$$\begin{array}{r} \text{kg} \quad \text{g} \\ 11 \quad 900 \\ + 11 \quad 550 \\ \hline 0 \quad 350 \end{array}$$

Hence, Meenakshi bought more fruits and by 350 g.

Exercise 4.2

1. (a) 30.1×7

$$\begin{array}{r} 30.1 \\ \times 7 \\ \hline 210.7 \end{array}$$

(b) 8.03×12

$$\begin{array}{r} 8.03 \\ \times 12 \\ \hline 1606 \\ 803 \times \\ \hline 96.36 \end{array}$$

(c) 27.3×11

$$\begin{array}{r} 27.3 \\ \times 11 \\ \hline 273 \\ 273 \times \\ \hline 300.3 \end{array}$$

(d) 203.25×5

$$\begin{array}{r} 203.25 \\ \times 5 \\ \hline 101625 \\ 142275 \times \\ \hline 15243.75 \end{array}$$

(e) 503.07×124

$$\begin{array}{r} 503.07 \\ \times 124 \\ \hline 201228 \\ 100614 \times \\ 50307 \times \times \\ \hline 62380.68 \end{array}$$

(f) 157.4×25

$$\begin{array}{r} 1574 \\ \times 25 \\ \hline 7870 \\ 3148 \times \\ \hline 3935.0 \end{array}$$

$$\begin{array}{r} \text{(g)} \quad 602.63 \times 218 \\ 602.63 \\ \times 218 \\ \hline 4821.04 \\ 60263 \times \\ \hline 120526 \times \times \\ \hline \underline{131373.34} \end{array}$$

$$\begin{array}{r} \text{(h)} \quad 20.263 \times 116 \\ 20.263 \\ \times 116 \\ \hline 121578 \\ 20263 \times \\ \hline 20263 \times \times \\ \hline \underline{2350.508} \end{array}$$

$$\begin{array}{r} \text{(i)} \quad 7.093 \times 307 \\ 7.093 \\ \times 307 \\ \hline 49651 \\ 0000 \times \\ \hline 21279 \times \times \\ \hline \underline{2177.551} \end{array}$$

$$\begin{array}{r} \text{(j)} \quad 159.82 \times 435 \\ 159.82 \\ \times 435 \\ \hline 79910 \\ 47946 \times \\ \hline 63928 \times \times \\ \hline \underline{69521.70} \end{array}$$

$$\begin{array}{r} \text{(k)} \quad 64.32 \times 32 \\ 64.32 \\ \times 32 \\ \hline 12864 \\ 19296 \times \\ \hline \underline{2058.24} \end{array}$$

$$\begin{array}{r} \text{(l)} \quad 0.941 \times 307 \\ 0.941 \\ \times 307 \\ \hline 6587 \\ 000 \times \\ \hline 2823 \times \times \\ \hline \underline{288.887} \end{array}$$

$$\begin{array}{r} \text{(m)} \quad 4.138 \times 69 \\ 4.138 \\ \times 69 \\ \hline 37.242 \\ 248.28 \times \\ \hline \underline{285.522} \end{array}$$

$$\begin{array}{r} \text{(n)} \quad 2695.2 \times 120 \\ 2695.2 \\ \times 120 \\ \hline 00000 \\ 53904 \times \\ \hline 26952 \times \times \\ \hline \underline{3234240} \end{array}$$

$$\begin{array}{r} \text{(o)} \quad 51.82 \times 125 \\ 51.82 \\ \times 125 \\ \hline 25910 \\ 10364 \times \\ \hline 5182 \times \times \\ \hline \underline{6477.50} \end{array}$$

2. (a) $4.7 \times 10 = 47$ (b) $27.73 \times 10 = 277.3$ (c) $253.05 \times 10 = 2530.5$
 (d) $34.24 \times 100 = 3424$ (e) $2769.3 \times 100 = 276930$ (f) $4.973 \times 100 = 497.3$
 (g) $28.646 \times 100 = 2864.6$ (h) $525.45 \times 100 = 52545$ (i) $757.2 \times 100 = 75720$
 (j) $7.167 \times 1000 = 7167$ (k) $245.7 \times 10000 = 245700$
 (l) $0.7584 \times 1000 = 758.4$ (m) $0.0065 \times 1000 = 6.5$
 (n) $27.05 \times 1000 = 27050$ (o) $59.83424 \times 1000 = 59834.24$

Exercise 4.3

1. (a)
$$\begin{array}{r} 0.4 \\ \times 0.7 \\ \hline 0.28 \end{array}$$
 (b)
$$\begin{array}{r} 2.6 \\ \times 0.4 \\ \hline 1.04 \end{array}$$
 (c)
$$\begin{array}{r} 0.23 \\ \times 0.8 \\ \hline 0.184 \end{array}$$
- (d)
$$\begin{array}{r} 2.54 \\ \times 2.5 \\ \hline 1270 \\ 508 \times \\ \hline 6.350 \end{array}$$
 (e)
$$\begin{array}{r} 28.34 \\ \times 6.4 \\ \hline 11336 \\ 17004 \times \\ \hline 181.376 \end{array}$$
 (f)
$$\begin{array}{r} 68.07 \\ \times 2.4 \\ \hline 27228 \\ 13614 \times \\ \hline 163.368 \end{array}$$
- (g)
$$\begin{array}{r} 29.84 \\ \times 27.94 \\ \hline 11936 \\ 26856 \times \\ \hline 20888 \times \times \\ \hline 5968 \times \times \times \\ \hline \underline{833.7296} \end{array}$$
 (h)
$$\begin{array}{r} 54.63 \\ \times 9.75 \\ \hline 27315 \\ 38241 \times \\ \hline 49167 \times \times \\ \hline \underline{532.6425} \end{array}$$
 (i)
$$\begin{array}{r} 7.306 \\ \times 82.6 \\ \hline 43836 \\ 14612 \times \\ \hline 58448 \times \times \\ \hline \underline{603.4756} \end{array}$$

<p>(j) $\begin{array}{r} 78.78 \\ \times 6.57 \\ \hline 55146 \\ 39390\times \\ 47268\times\times \\ \hline 517.5846 \end{array}$</p>	<p>(k) $\begin{array}{r} 0.436 \\ \times 0.47 \\ \hline 3052 \\ 1744\times \\ \hline 0.20492 \end{array}$</p>	<p>(l) $\begin{array}{r} 0.626 \\ \times 0.237 \\ \hline 4382 \\ 1878\times \\ 1252\times\times \\ \hline 0.148362 \end{array}$</p>
<p>(m) $\begin{array}{r} 3.00607 \\ 6.0308 \\ 2404856 \\ 000000\times \\ 901821\times\times \\ 000000\times\times\times \\ 1803642\times\times\times\times \\ \hline 18.129006956 \end{array}$</p>	<p>(n) $\begin{array}{r} 8.004 \\ 0.007 \\ 56028 \\ 0000\times \\ 0000\times\times \\ \hline 0.056028 \end{array}$</p>	<p>(o) $\begin{array}{r} 0.226 \\ \times 0.14 \\ \hline 904 \\ 226\times \\ \hline 0.03164 \end{array}$</p>
<p>(p) $\begin{array}{r} 536.78 \\ \times 7.934 \\ \hline 214712 \\ 161034\times \\ 483102\times\times \\ 375746\times\times\times \\ \hline 4258.81252 \end{array}$</p>		

2. (a) Let us find the product $7 \times 7 \times 74$

$$\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array} \qquad \begin{array}{r} 49 \\ \times 74 \\ \hline 196 \\ 343\times \\ \hline 3626 \end{array}$$

Now, sum of decimal places in given decimal = $2 + 1 + 2 = 5$

So, $0.07 \times 0.7 \times 0.74 = 0.03626$

(b) Let us find product $128 \times 32 \times 7$

$$\begin{array}{r} 128 \\ \times 32 \\ \hline 256 \\ 384\times \\ \hline 4096 \end{array} \qquad \begin{array}{r} 4096 \\ \times 7 \\ \hline 28672 \end{array}$$

Now, sum of decimal places in given decimal

$$= 2 + 2 + 2 = 6$$

So, $1.28 \times 0.32 \times 0.07 = 0.028672$

(c) Let us find the product $5 \times 5 \times 5$

$$\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array} \qquad \begin{array}{r} 25 \\ \times 5 \\ \hline 125 \end{array}$$

Now, sum of decimal places in given decimal

$$= 2 + 2 + 2 = 6$$

So, $0.05 \times 0.05 \times 0.05 = 0.000125$

- (d) Let us find the product $364 \times 14 \times 56$

$$\begin{array}{r} 364 \\ \times 14 \\ \hline 1456 \\ 364 \times \\ \hline 5096 \end{array} \qquad \begin{array}{r} 5096 \\ \times 56 \\ \hline 30576 \\ 25480 \times \\ \hline 285376 \end{array}$$

Now, sum of decimal places in given decimal
 $= 2 + 1 + 2 = 5$

So, $3.64 \times 1.4 \times 0.56 = 2.85376$

- (e) Let us find the product $82 \times 68 \times 64$

$$\begin{array}{r} 82 \\ \times 68 \\ \hline 656 \\ 492 \times \\ \hline 5576 \end{array} \qquad \begin{array}{r} 5576 \\ \times 64 \\ \hline 22304 \\ 33456 \times \\ \hline 356864 \end{array}$$

Now, sum of decimal places in given decimal
 $= 1 + 1 + 1 = 3$

So, $8.2 \times 6.8 \times 6.4 = 356.864$

- (f) Let us find the product $574 \times 92 \times 3$

$$\begin{array}{r} 574 \\ \times 92 \\ \hline 1148 \\ 5166 \times \\ \hline 52808 \end{array} \qquad \begin{array}{r} 52808 \\ \times 3 \\ \hline 158424 \end{array}$$

Now, sum of decimal places in given decimal
 $= 2 + 1 + 1 = 4$

So, $5.74 \times 9.2 \times 0.3 = 15.8424$

- (g) Let us find the product $51 \times 9 \times 32$

$$\begin{array}{r} 51 \\ \times 9 \\ \hline 459 \end{array} \qquad \begin{array}{r} 459 \\ \times 32 \\ \hline 918 \\ 1377 \times \\ \hline 14688 \end{array}$$

Now, sum of decimal places in given decimal
 $= 1 + 2 + 3 = 6$

So, $5.1 \times 0.09 \times 0.032 = 0.014688$

- (h) Let us find the product $506 \times 436 \times 9$

$$\begin{array}{r} 506 \\ \times 436 \\ \hline 3036 \\ 1518 \times \\ 2024 \times \\ \hline 220616 \end{array} \qquad \begin{array}{r} 220616 \\ \times 9 \\ \hline 1985544 \end{array}$$

Now, sum of decimal places in given decimal
 $= 3 + 2 + 2 = 7$

So, $0.506 \times 4.36 \times 9 = 0.1985544$

- (i) Let us find the product $404 \times 23 \times 7$

$$\begin{array}{r} 404 \\ \times 23 \\ \hline 1212 \\ 808 \times \\ \hline 9292 \end{array} \qquad \begin{array}{r} 9292 \\ \times 7 \\ \hline 65044 \end{array}$$

Now, sum of decimal places in given decimal = $2 + 1 + 3 = 6$

So, $4.04 \times 2.3 \times 0.007 = 0.065044$

3. Since, $412 \times 17 = 7004$

(a) $\therefore 4.12 \times 17 = 70.04$ (b) $\therefore 41.2 \times 17 = 700.4$
 (c) $\therefore 0.412 \times 12 = 7.004$ (d) $\therefore 0.00412 \times 17 = 0.07004$

4. Since $549.3 \times 5 = 2746.5$

(a) $\therefore 54.93 \times 5 = 274.65$ (b) $\therefore 5493 \times 5 = 27465$ (c) $\therefore 5.493 \times 5 = 27.465$
 (d) $\therefore 54.93 \times 0.5 = 27.465$ (e) $\therefore 0.5493 \times 5 = 2.7465$ (f) $\therefore 0.05493 \times 5 = 0.27465$

5. (a) Let us find the product $33 \times 3 \times 3$

$$\begin{array}{r} 33 \\ \times 3 \\ \hline 99 \end{array} \qquad \begin{array}{r} 99 \\ \times 3 \\ \hline 297 \end{array}$$

Now, sum of decimal places in given decimal = $1 + 1 + 2 = 4$

So, $3.3 \times 0.3 \times 0.03 = 0.0297$

- (b) Let us find the product $4 \times 4 \times 4$

$$\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array} \qquad \begin{array}{r} 16 \\ \times 4 \\ \hline 64 \end{array}$$

Now, sum of decimal places in given decimal = $1 + 2 + 3 = 6$

So, $0.4 \times 0.04 \times 0.004 = 0.000064$

- (c) Let us find the product $44 \times 4 \times 4$

$$\begin{array}{r} 44 \\ \times 4 \\ \hline 176 \end{array} \qquad \begin{array}{r} 176 \\ \times 4 \\ \hline 704 \end{array}$$

Now, sum of decimal places in given decimal = $1 + 1 + 2 = 4$

So, $4.4 \times 0.4 \times 0.04 = 0.0704$

- (d) Let us find the product $24 \times 14 \times 4 \times 34$

$$\begin{array}{r} 24 \\ \times 14 \\ \hline 96 \end{array} \qquad \begin{array}{r} 336 \\ \times 4 \\ \hline 1344 \end{array} \qquad \begin{array}{r} 1344 \\ \times 34 \\ \hline 5376 \end{array}$$

$$\begin{array}{r} 24 \times \\ \hline 336 \end{array} \qquad \begin{array}{r} 4032 \times \\ \hline 45696 \end{array}$$

Now, sum of decimal places in given decimal = $1 + 1 + 1 + 2 = 5$

So, $2.4 \times 1.4 \times 0.4 \times 0.34 = 0.45696$

Exercise 4.4

1. We have,

Hence, $3.6 \div 2 = 1.8$

$$\begin{array}{r} 2 \overline{) 3.6} (1.8 \\ \underline{-2} \\ 16 \\ \underline{-16} \\ \times \end{array}$$

2. We have,

Hence, $5.4 \div 9 = 0.6$

$$\begin{array}{r} 9 \overline{) 5.4} (0.6 \\ \underline{-54} \\ \times \end{array}$$

3. We have,

$$\begin{array}{r} 3 \overline{) 24.6} (8.2 \\ \underline{-24} \\ 6 \\ \underline{-6} \\ \times \end{array}$$

Hence, $24.6 \div 3 = 8.2$

4. We have,

$$\begin{array}{r} 16 \overline{) 40.86} (2.55375 \\ \underline{-32} \\ 88 \\ \underline{-80} \\ 86 \\ \underline{-80} \\ 60 \\ \underline{-48} \\ 120 \\ \underline{-112} \\ 80 \\ \underline{-80} \\ \times \end{array}$$

Hence, $40.86 \div 16 = 2.55375$

5. We have,

$$\begin{array}{r} 16 \overline{) 82.04} (5.1275 \\ \underline{-80} \\ 20 \\ \underline{-16} \\ 44 \\ \underline{-32} \\ 120 \\ \underline{-112} \\ 80 \\ \underline{-80} \\ \times \end{array}$$

Hence, $82.04 \div 16 = 5.1275$

6. We have,

$$\begin{array}{r} 11 \overline{) 1125.3} (102.3 \\ \underline{-11} \\ 25 \\ \underline{-22} \\ 33 \\ \underline{-33} \\ \times \end{array}$$

Hence, $1125.3 \div 11 = 102.3$

7. We have,

$$\begin{array}{r} 13 \overline{) 10.608} (0.816 \\ \underline{-104} \\ 20 \\ \underline{-13} \\ 78 \\ \underline{-78} \\ \times \end{array}$$

Hence, $10.608 \div 13 = 0.816$

8. We have,

$$\begin{array}{r} 12 \overline{) 85.956} (7.163 \\ \underline{-84} \\ 19 \\ \underline{-12} \\ 75 \\ \underline{-72} \\ 36 \\ \underline{-36} \\ \times \end{array}$$

Hence, $85.956 \div 12 = 7.163$

9. We have,

$$\begin{array}{r} 33 \overline{) 2108.7} (63.9 \\ \underline{-198} \\ 128 \\ \underline{-99} \\ 297 \\ \underline{-297} \\ \times \end{array}$$

Hence, $2108.7 \div 33 = 63.9$

10. We have,

$$\begin{array}{r} 33 \overline{) 11942.7} (361.9 \\ \underline{-99} \\ 204 \\ \underline{-198} \\ 62 \\ \underline{-33} \\ 297 \\ \underline{-297} \\ \times \end{array}$$

Hence, $11942.7 \div 33 = 361.9$

11. We have,

$$\begin{array}{r} 25 \overline{) 1.877} \quad (0.7508 \\ \underline{-175} \\ 127 \\ \underline{-125} \\ 200 \\ \underline{-200} \\ \times \end{array}$$

Hence, $1.877 \div 25 = 0.7508$

13. We have,

$$\begin{array}{r} 25 \overline{) 3.45} \quad (0.138 \\ \underline{-25} \\ 95 \\ \underline{-75} \\ 200 \\ \underline{-200} \\ \times \end{array}$$

Hence, $3.45 \div 25 = 0.138$

15. We have,

$$\begin{array}{r} 18 \overline{) 1842.48} \quad (102.36 \\ \underline{-18} \\ 42 \\ \underline{-36} \\ 64 \\ \underline{-54} \\ 108 \\ \underline{-108} \\ \times \end{array}$$

Hence, $1842.48 \div 18 = 102.36$

16. We have

$$\begin{array}{r} 15 \overline{) 90.585} \quad (6.039 \\ \underline{-90} \\ 58 \\ \underline{-45} \\ 135 \\ \underline{-135} \\ \times \end{array}$$

Hence, $90.585 \div 15 = 6.039$

18. We have,

$$\begin{array}{r} 76 \overline{) 6.84} \quad (0.09 \\ \underline{-684} \\ \times \end{array}$$

Hence, $6.84 \div 76 = 0.09$

12. We have,

$$\begin{array}{r} 34 \overline{) 33.32} \quad (0.98 \\ \underline{-306} \\ 272 \\ \underline{-272} \\ \times \end{array}$$

Hence, $33.32 \div 34 = 0.98$

14. We have,

$$\begin{array}{r} 16 \overline{) 1302.4} \quad (81.4 \\ \underline{-128} \\ 22 \\ \underline{-16} \\ 64 \\ \underline{-64} \\ \times \end{array}$$

Hence, $1302.4 \div 16 = 81.4$

17. We have,

$$\begin{array}{r} 35 \overline{) 3565.1} \quad (101.8 \\ \underline{-35} \\ 65 \\ \underline{-35} \\ 301 \\ \underline{-280} \\ 210 \\ \underline{-210} \\ \times \end{array}$$

Hence, $3565.1 \div 35 = 101.8$

19. We have,

$$\begin{array}{r} 9 \overline{) 66.312} \overline{) 7.368} \\ \underline{-63} \\ 33 \\ \underline{-27} \\ 61 \\ \underline{-54} \\ 72 \\ \underline{-72} \\ \times \end{array}$$

Hence, $66.312 \div 9 = 7.368$

20. We have,

$$\begin{array}{r} 45 \overline{) 75.15} \overline{) 1.67} \\ \underline{-45} \\ 301 \\ \underline{-270} \\ 315 \\ \underline{-315} \\ \times \end{array}$$

Hence, $75.15 \div 45 = 1.67$

Exercise 4.5

- $22.5 \div 10 = \frac{225}{10} \div 10 = \frac{225}{10} \times \frac{1}{10} = \frac{225}{100} = 2.25$
- $52.48 \div 10 = \frac{5248}{100} \div 10 = \frac{5248}{100} \times \frac{1}{10} = \frac{5248}{1000} = 5.248$
- $872.4 \div 100 = \frac{8724}{10} \div 100 = \frac{8724}{10} \times \frac{1}{100} = \frac{8724}{1000} = 8.724$
- $0.246 \div 10 = \frac{246}{1000} \div 10 = \frac{246}{1000} \times \frac{1}{10} = \frac{246}{10000} = 0.0246$
- $777.1 \div 10 = \frac{7771}{10} \div 10 = \frac{7771}{10} \times \frac{1}{10} = \frac{7771}{100} = 77.71$
- $0.08 \div 10 = \frac{8}{100} \div 10 = \frac{8}{100} \times \frac{1}{10} = \frac{8}{1000} = 0.008$
- $92 \div 100 = 92 \times \frac{1}{100} = \frac{92}{100} = 0.92$
- $387.58 \div 100 = \frac{38758}{100} \div 100 = \frac{38758}{100} \times \frac{1}{100} = \frac{38758}{10000} = 3.8758$
- $7.12 \div 100 = \frac{712}{100} \div 100 = \frac{712}{100} \times \frac{1}{100} = \frac{712}{10000} = 0.0712$
- $2185 \div 100 = 2185 \times \frac{1}{100} = \frac{2185}{100} = 21.85$
- $0.06 \div 100 = \frac{6}{100} \div 100 = \frac{6}{100} \times \frac{1}{100} = \frac{6}{10000} = 0.0006$
- $1642.7 \div 100 = \frac{16427}{10} \div 100 = \frac{16427}{10} \times \frac{1}{100} = \frac{16427}{1000} = 16.427$
- $875.37 \div 1000 = \frac{87537}{100} \div 1000 = \frac{87537}{100} \times \frac{1}{1000} = \frac{87537}{100000} = 0.87537$
- $58.7 \div 1000 = \frac{587}{10} \div 1000 = \frac{587}{10} \times \frac{1}{1000} = \frac{587}{10000} = 0.0587$
- $4.3548 \div 1000 = \frac{43548}{10000} \div 1000 = \frac{43548}{10000} \times \frac{1}{1000} = \frac{43548}{1000000} = 0.0043548$
- $12.46 \div 1000 = \frac{1246}{100} \div 1000 = \frac{1246}{100} \times \frac{1}{1000} = \frac{1246}{100000} = 0.01246$

Note for question number 17 to 32 that we first divide by 10, 100, 1000 etc, then by a whole number.

$$\begin{aligned}
 17. \quad 104.96 \div 40 &= \frac{104.96}{40} \\
 &= \frac{104.96}{10} \\
 &= \frac{104.96}{10} \times \frac{1}{4} \\
 &= \frac{10496}{4} \\
 &= 2624
 \end{aligned}$$

$$\begin{array}{r}
 \overline{4)10.496} (2.624 \\
 \underline{-8} \\
 24 \\
 \underline{-24} \\
 9 \\
 \underline{-8} \\
 16 \\
 \underline{-16} \\
 \times
 \end{array}$$

$$\begin{aligned}
 18. \quad 374.96 \div 80 &= \frac{374.96}{80} \\
 &= \frac{374.96}{10 \times 8} = \frac{374.96}{80} \times \frac{1}{8} \\
 &= \frac{374.96}{10} \times \frac{1}{8} \\
 &= 37.496 \times \frac{1}{8} = \frac{37.496}{8} = 4.687
 \end{aligned}$$

$$\begin{array}{r}
 \overline{8)37.496} (4.687 \\
 \underline{-32} \\
 54 \\
 \underline{-48} \\
 69 \\
 \underline{-64} \\
 56 \\
 \underline{-56} \\
 \times
 \end{array}$$

$$\begin{aligned}
 19. \quad 458.5 \div 50 &= \frac{458.5}{50} \\
 &= \frac{458.5}{10 \times 5} \\
 &= \frac{458.5}{10} \times \frac{1}{5} \\
 &= 45.85 \times \frac{1}{5} = \frac{45.85}{5} = 9.17
 \end{aligned}$$

$$\begin{array}{r}
 \overline{5)45.85} (9.17 \\
 \underline{-45} \\
 8 \\
 \underline{-5} \\
 35 \\
 \underline{-35} \\
 \times
 \end{array}$$

$$\begin{aligned}
 20. \quad 106.02 \div 90 &= \frac{106.02}{90} \\
 &= \frac{106.02}{10 \times 9} \\
 &= \frac{106.02}{10} \times \frac{1}{9} \\
 &= 10.602 \times \frac{1}{9} = \frac{10.602}{9} = 1.178
 \end{aligned}$$

$$\begin{array}{r}
 \overline{9)10.602} (1.178 \\
 \underline{-9} \\
 16 \\
 \underline{-9} \\
 70 \\
 \underline{-63} \\
 72 \\
 \underline{-72} \\
 \times
 \end{array}$$

$$\begin{aligned}
 21. \quad 635.95 \div 700 &= \frac{635.95}{700} \\
 &= \frac{635.95}{100 \times 7} \\
 &= \frac{635.95}{100} \times \frac{1}{7} \\
 &= 6.3595 \times \frac{1}{7} = \frac{6.3595}{7} = 0.9085
 \end{aligned}$$

$$\begin{array}{r}
 \overline{7)6.3595} (0.9085 \\
 \underline{-63} \\
 59 \\
 \underline{-56} \\
 35 \\
 \underline{-35} \\
 \times
 \end{array}$$

$$\begin{aligned}
 22. \quad 14.4 \div 6000 &= \frac{14.4}{6000} \\
 &= \frac{14.4}{1000 \times 6} \\
 &= \frac{14.4}{1000} \times \frac{1}{6} = 0.0144 \times \frac{1}{6} = \frac{0.0144}{6} = 0.0024
 \end{aligned}$$

$$\begin{array}{r}
 \overline{6)0.0144}(0.0024 \\
 \underline{-12} \\
 24 \\
 \underline{-24} \\
 \times
 \end{array}$$

$$\begin{aligned}
 23. \quad 650.3 \div 7000 &= \frac{650.3}{7000} \\
 &= \frac{650.3}{1000 \times 7} \\
 &= \frac{650.3}{1000} \times \frac{1}{7} \\
 &= 0.6503 \times \frac{1}{7} = \frac{0.6503}{7} = 0.0929
 \end{aligned}$$

$$\begin{array}{r}
 \overline{7)0.6503}(0.0939 \\
 \underline{-63} \\
 20 \\
 \underline{-14} \\
 63 \\
 \underline{-63} \\
 \times
 \end{array}$$

$$\begin{aligned}
 24. \quad 76.2 \div 3000 &= \frac{76.2}{3000} \\
 &= \frac{76.2}{1000} \times \frac{1}{3} \\
 &= 0.0762 \times \frac{1}{3} \\
 &= \frac{0.0762}{3} = 0.0254
 \end{aligned}$$

$$\begin{array}{r}
 \overline{3)0.0762}(0.0254 \\
 \underline{-6} \\
 16 \\
 \underline{-15} \\
 12 \\
 \underline{-12} \\
 \times
 \end{array}$$

$$\begin{aligned}
 25. \quad 98.1 \div 300 &= \frac{98.1}{300} \\
 &= \frac{98.1}{100} \times \frac{1}{3} \\
 &= 0.981 \times \frac{1}{3} = \frac{0.981}{3} = 0.327
 \end{aligned}$$

$$\begin{array}{r}
 \overline{3)0.981}(0.327 \\
 \underline{-9} \\
 8 \\
 \underline{-6} \\
 21 \\
 \underline{-21} \\
 \times
 \end{array}$$

$$\begin{aligned}
 26. \quad 46.4 \div 8000 &= \frac{46.4}{8000} \\
 &= \frac{46.4}{1000 \times 8} \\
 &= \frac{46.4}{1000} \times \frac{1}{8} \\
 &= 0.0464 \times \frac{1}{8} = 0.0464 \div 8 = 0.0058
 \end{aligned}$$

$$\begin{array}{r}
 \overline{8)0.0464}(0.0058 \\
 \underline{-40} \\
 64 \\
 \underline{-64} \\
 \times
 \end{array}$$

$$\begin{aligned}
 27. \quad 12.04 \div 4000 &= \frac{12.04}{4000} \\
 &= \frac{12.04}{1000 \times 4} \\
 &= \frac{12.04}{1000} \times \frac{1}{4} \\
 &= 0.01204 \times \frac{1}{4} = \frac{0.01204}{4} = 0.00301
 \end{aligned}$$

$$\begin{array}{r}
 \overline{4)0.01204}(0.00301 \\
 \underline{-12} \\
 04 \\
 \underline{-04} \\
 \times
 \end{array}$$

$$\begin{aligned}
 28. \quad 15.36 \div 600 &= \frac{15.36}{600} \\
 &= \frac{15.36}{100 \times 6} \\
 &= \frac{15.36}{100} \times \frac{1}{6} \\
 &= 0.1536 \times \frac{1}{6} = \frac{0.1536}{6} = 0.0256
 \end{aligned}$$

$$\begin{array}{r}
 \overline{3)0.1536} \overline{)0.0256} \\
 \underline{-12} \\
 33 \\
 \underline{-30} \\
 36 \\
 \underline{-36} \\
 \times
 \end{array}$$

$$\begin{aligned}
 29. \quad 320.46 \div 200 &= \frac{320.46}{200} \\
 &= \frac{320.46}{100 \times 2} \\
 &= \frac{320.46}{100} \times \frac{1}{2} \\
 &= 3.2046 \times \frac{1}{2} = 1.6023
 \end{aligned}$$

$$\begin{array}{r}
 \overline{2)3.02046} \overline{)1.6023} \\
 \underline{-2} \\
 12 \\
 \underline{-12} \\
 04 \\
 \underline{-04} \\
 6 \\
 \underline{-6} \\
 \times
 \end{array}$$

$$\begin{aligned}
 30. \quad 185.04 \div 9000 &= \frac{185.04}{9000} \\
 &= \frac{185.04}{1000 \times 9} \\
 &= \frac{185.04}{1000} \times \frac{1}{9} \\
 &= 0.18504 \times \frac{1}{9} = \frac{0.18504}{9} = 0.02056
 \end{aligned}$$

$$\begin{array}{r}
 \overline{9)0.18504} \overline{)0.02056} \\
 \underline{-18} \\
 50 \\
 \underline{-45} \\
 56 \\
 \underline{-56} \\
 \times
 \end{array}$$

$$\begin{aligned}
 31. \quad 166.8 \div 6000 &= \frac{166.8}{6000} = \frac{166.8}{1000 \times 6} \\
 &= \frac{166.8}{1000} \times \frac{1}{6} \\
 &= 0.1668 \times \frac{1}{6} \\
 &= \frac{0.1668}{6} \\
 &= \frac{0.1668}{6} = 0.0278
 \end{aligned}$$

$$\begin{array}{r}
 \overline{6)0.1668} \overline{)0.0278} \\
 \underline{-12} \\
 46 \\
 \underline{-42} \\
 48 \\
 \underline{-48} \\
 \times
 \end{array}$$

$$\begin{aligned}
 32. \quad 22.6 \div 500 &= \frac{22.6}{500} \\
 &= \frac{22.6}{100} \times \frac{1}{5} \\
 &= 0.226 \times \frac{1}{5} \\
 &= \frac{0.226}{5} \\
 &= 0.0452
 \end{aligned}$$

$$\begin{array}{r}
 \overline{5)0.226} \overline{)0.0452} \\
 \underline{-20} \\
 26 \\
 \underline{-25} \\
 10 \\
 \underline{-10} \\
 \times
 \end{array}$$

Exercise 4.6

1. By making all divisor a whole number.

(a) The sum becomes $225 \div 15$

$$\begin{array}{r} 15 \overline{)225} \text{ (15)} \\ \underline{-15} \\ 75 \\ \underline{-75} \\ \times \end{array}$$

Hence, $0.225 \div 0.015 = 15$

(c) The sum becomes $80.85 \div 35$

$$\begin{array}{r} 35 \overline{)80.85} \text{ (2.31)} \\ \underline{-70} \\ 108 \\ \underline{-105} \\ 35 \\ \underline{-35} \\ \times \end{array}$$

Hence, $0.8085 \div 0.35 = 2.31$

(e) The sum becomes $253.95 \div 15$

$$\begin{array}{r} 15 \overline{)253.95} \text{ (16.93)} \\ \underline{-15} \\ 103 \\ \underline{-90} \\ 139 \\ \underline{-135} \\ 45 \\ \underline{-45} \\ \times \end{array}$$

Hence, $25.395 \div 1.5 = 16.93$

(g) The sum becomes $13.05 \div 9$

$$\begin{array}{r} 9 \overline{)13.05} \text{ (1.45)} \\ \underline{-9} \\ 40 \\ \underline{-36} \\ 45 \\ \underline{-45} \\ \times \end{array}$$

Hence, $1.305 \div 0.9 = 1.45$

(i) The sum becomes $3705.3 \div 537$

$$\begin{array}{r} 537 \overline{)3705.3} \text{ (6.9)} \\ \underline{-3222} \\ 4833 \\ \underline{-4833} \\ \times \end{array}$$

Hence, $37.053 \div 5.37 = 6.9$

(b) The sum becomes $108 \div 9$

$$\begin{array}{r} 9 \overline{)108} \text{ (9)} \\ \underline{-9} \\ 18 \\ \underline{-18} \\ \times \end{array}$$

Hence, $0.0108 \div 0.0009 = 12$

(d) The sum becomes $490.7 \div 85$

$$\begin{array}{r} 85 \overline{)490.7} \text{ (5.77)} \\ \underline{-425} \\ 657 \\ \underline{-595} \\ 620 \\ \underline{-595} \\ 25 \text{ R} \end{array}$$

Hence, $49.07 \div 8.5 = 5.77$

(f) The sum becomes $6 \div 4$

$$\begin{array}{r} 4 \overline{)6} \text{ (1.5)} \\ \underline{-4} \\ 20 \\ \underline{-20} \\ \times \end{array}$$

Hence, $0.6 \div 0.4 = 1.5$

(h) The sum becomes $236600 \div 26$

$$\begin{array}{r} 26 \overline{)236600} \text{ (9100)} \\ \underline{-234} \\ 26 \\ \underline{-26} \\ 00 \\ 00 \end{array}$$

Hence, $236.6 \div 0.026 = 9100$

- (j) The sum becomes $1089.97 \div 23$

$$\begin{array}{r} 23 \overline{)1089.97} \text{ (37.39)} \\ \underline{-92} \\ 169 \\ \underline{-161} \\ 89 \\ \underline{-69} \\ 207 \\ \underline{-207} \\ \times \end{array}$$

Hence, $108.997 \div 2.3 = 37.39$

- (l) The sum becomes $204.84 \div 18$

$$\begin{array}{r} 18 \overline{)204.84} \text{ (11.38)} \\ \underline{-18} \\ 24 \\ \underline{-18} \\ 68 \\ \underline{-54} \\ 144 \\ \underline{-144} \\ \times \end{array}$$

Hence, $2.0484 \div 0.18 = 11.38$

- (m) The sum becomes $13158 \div 215$

$$\begin{array}{r} 215 \overline{)13158} \text{ (61.2)} \\ \underline{-1290} \\ 258 \\ \underline{-215} \\ 430 \\ \underline{-430} \\ \times \end{array}$$

Hence, $131.58 \div 2.15 = 61.5$

- (p) The sum becomes $1490 \div 64$

$$\begin{array}{r} 64 \overline{)1490} \text{ (23.2825)} \\ \underline{-128} \\ 210 \\ \underline{-192} \\ 180 \\ \underline{-128} \\ 520 \\ \underline{-512} \\ 80 \\ \underline{-64} \\ 160 \\ \underline{-128} \\ 320 \\ \underline{-320} \\ \times \end{array}$$

Hence, $14.9 \div 0.64 = 23.28125$

- (k) The sum becomes $1296 \div 108$

$$\begin{array}{r} 108 \overline{)1296} \text{ (12)} \\ \underline{-108} \\ 216 \\ \underline{-216} \\ \times \end{array}$$

Hence, $1.296 \div 0.108 = 12$

- (n) The sum becomes $25.2 \div 12$

$$\begin{array}{r} 12 \overline{)25.2} \text{ (2.1)} \\ \underline{-24} \\ 12 \\ \underline{-12} \\ \times \end{array}$$

Hence, $2.52 \div 1.2 = 2.1$

- (o) The sum becomes $5.4 \div 6$

$$\begin{array}{r} 6 \overline{)5.4} \text{ (0.9)} \\ \underline{-54} \\ \times \end{array}$$

Hence, $0.054 \div 0.06 = 0.9$

- (q) The sum becomes $561.92 \div 32$

$$\begin{array}{r} 32 \overline{)561.92} \text{ (17.56)} \\ \underline{-32} \\ 241 \\ \underline{-224} \\ 179 \\ \underline{-160} \\ 192 \\ \underline{-192} \\ \times \end{array}$$

Hence, $56.192 \div 3.2 = 17.56$

(r) The sum becomes $1085.4 \div 18$

$$\begin{array}{r} 18 \overline{)1085.4} \quad (60.3 \\ \underline{-108} \\ 54 \\ \underline{-54} \\ \times \end{array}$$

Hence, $108.54 \div 1.8 = 60.3$

(t) The sum becomes $2197.6 \div 164$

$$\begin{array}{r} 164 \overline{)2197.6} \quad (13.4 \\ \underline{-164} \\ 557 \\ \underline{-492} \\ 656 \\ \underline{-656} \\ \times \end{array}$$

Hence, $21.976 \div 1.64 = 13.4$

2. By making the divisor a whole number.

(a) The sum becomes $989400 \div 388$

$$\begin{array}{r} 388 \overline{)989400} \quad (2550 \\ \underline{-776} \\ 2134 \\ \underline{-1940} \\ 1940 \\ \underline{-1940} \\ \times \end{array}$$

Hence, $9894 \div 3.88 = 2550$

(c) The sum becomes $148000 \div 74$

$$\begin{array}{r} 74 \overline{)148000} \quad (2000 \\ \underline{-148} \\ 000 \\ \underline{-000} \\ \times \end{array}$$

Hence, $148 \div 0.074 = 2000$

(e) The sum becomes $800 \div 4$

$$\begin{array}{r} 4 \overline{)800} \quad (200 \\ \underline{-8} \\ 0 \\ \underline{-0} \\ 0 \\ \underline{-0} \\ \times \end{array}$$

Hence, $8 \div 0.04 = 200$

(s) The sum becomes $0.114 \div 19$

$$\begin{array}{r} 19 \overline{)0.114} \quad (0.006 \\ \underline{-114} \\ \times \end{array}$$

Hence, $0.0114 \div 1.9 = 0.006$

(b) The sum becomes $72000 \div 144$

$$\begin{array}{r} 144 \overline{)72000} \quad (500 \\ \underline{-720} \\ \times \end{array}$$

Hence, $72 \div 0.144 = 500$

(d) The sum becomes $82200 \div 1644$

$$\begin{array}{r} 1644 \overline{)82200} \quad (50 \\ \underline{-8220} \\ 0 \\ \underline{-0} \\ \times \end{array}$$

Hence, $822 \div 16.44 = 50$

(f) The sum becomes $160 \div 8$

$$\begin{array}{r} 8 \overline{)160} \quad (20 \\ \underline{-16} \\ 0 \\ \underline{-0} \\ 0 \\ \times \end{array}$$

Hence, $16 \div 0.8 = 20$

- (g) The sum becomes $4128000 \div 8256$ (h) The sum becomes $63000 \div 375$

$$\begin{array}{r} 8256 \overline{) 4128000} \text{ (500)} \\ \underline{-41280} \\ 00 \\ \underline{-00} \\ \times \end{array}$$

Hence, $4128 \div 8.256 = 500$

$$\begin{array}{r} 375 \overline{) 63000} \text{ (168)} \\ \underline{-375} \\ 2550 \\ \underline{-2250} \\ 3000 \\ \underline{-3000} \\ \times \end{array}$$

Hence, $630 \div 3.75 = 168$

3. (a)
$$\begin{array}{r} 25 \overline{) 26} \text{ (1.04)} \\ \underline{-25} \\ 100 \\ \underline{-100} \\ \times \end{array}$$

Thus, $26 \div 25 = 1.04$

(b)
$$\begin{array}{r} 40 \overline{) 23.0} \text{ (0.575)} \\ \underline{-200} \\ 300 \\ \underline{-280} \\ 200 \\ \underline{-200} \\ \times \end{array}$$

Thus, $23 \div 40 = 0.575$

(c)
$$\begin{array}{r} 25 \overline{) 104} \text{ (4.16)} \\ \underline{-100} \\ 40 \\ \underline{-25} \\ 150 \\ \underline{-150} \\ \times \end{array}$$

Thus, $104 \div 25 = 4.16$

(d)
$$\begin{array}{r} 20 \overline{) 60} \text{ (0.3)} \\ \underline{-60} \\ \times \end{array}$$

Thus, $6 \div 20 = 0.3$

(e)
$$\begin{array}{r} 4 \overline{) 27} \text{ (6.75)} \\ \underline{-24} \\ 30 \\ \underline{-28} \\ 20 \\ \underline{-20} \\ \times \end{array}$$

Thus, $27 \div 4 = 6.75$

(f)
$$\begin{array}{r} 12 \overline{) 63} \text{ (5.25)} \\ \underline{-60} \\ 30 \\ \underline{-24} \\ 60 \\ \underline{-60} \\ \times \end{array}$$

Thus, $63 \div 12 = 5.25$

(g)
$$\begin{array}{r} 48 \overline{) 330} \text{ (0.6875)} \\ \underline{-288} \\ 420 \\ \underline{-384} \\ 360 \\ \underline{-336} \\ 240 \\ \underline{-240} \\ \times \end{array}$$

Thus, $33 \div 48 = 0.6875$

(h)
$$\begin{array}{r} 25 \overline{) 15.0} \text{ (0.6)} \\ \underline{-150} \\ \times \end{array}$$

Thus, $15 \div 25 = 0.6$

4. Since, $92.65 \div 5 = 18.53$

(a) $\therefore 926.5 \div 0.5 = 1853$

(b) $\therefore 92.65 \div 0.05 = 1853$

Exercise 4.7

1. Distance covered by the train in 22 hours = 452.76 km

\therefore distance covered by the train in 1 hour = $452.76 \div 22 = 20.58$ km

$$\begin{array}{r} 20.5 \\ 22 \overline{) 452.76} \\ \underline{-44} \\ 127 \\ \underline{-110} \\ 176 \\ \underline{-176} \\ \times \end{array}$$

Hence, 20.58 km covered by the train in 1 hour.

2. One drum can hold oil = 12.65 l

\therefore 23 such drums can hold oil = $12.65 \times 23 = 290.95$ litres

Hence, 290.95 litres can be hold 23 such drums.

3. Distance covered by a boat in 25 hours = 132.75 km

\therefore distance covered by a boat in 1 hour = $132.75 \div 25$
= 5.31 km

Hence, 5.31 km covered by a boat in 1 hour.

4. The cost of 1 litre of milk = ₹ 27.80

\therefore the cost of 25 litres of milk = ₹ 27.80×25
= ₹ 695

Hence, he should get ₹ 695.

5. The length of a rectangle = 5.6 cm

breadth = 4 cm

\therefore the area of a rectangle = length \times breadth

\therefore the area of a rectangle = $5.6 \times 4 \text{ cm}^2$
= 22.4 cm^2

Hence, the area of a rectangle is 22.4 cm^2 .

6. The total amount = ₹ 2502.50

No. of worker = 35

\therefore each worker gets money = ₹ $2502.50 \div 35$
= ₹ 71.50

Hence, each worker will get ₹ 71.50.

7. The cost of 1 m of cloth = ₹ 63.75

\therefore the cost of 25 m of cloth = ₹ 63.75×25
= ₹ 1593.75

Hence, the cost of 25 m of cloth is ₹ 1593.75

8. The cost of a fancy dress = ₹ 236.50

\therefore the cost of 4 such dresses = ₹ 4×236.50
= ₹ 946

Hence, the cost of 4 dresses is ₹ 946.

9. The cost of 15.5 litres of refined oil = ₹ 2038.25
 \therefore the cost of 1 litre of refined oil = ₹ $2038.25 \div 15.5 = ₹ 131.50$
Hence, the cost of 1 litre of refined oil is bought for ₹ 131.50 by her.
10. The height of a pile of books = 54.4 cm
The thickness of each book = 3.2 cm
 \therefore the number of books = $54.4 \div 3.2$
= 17
Hence, there are 17 books in a pile.
11. The cost of 18 kg of mangoes = ₹ 265.50
 \therefore the cost of 1 kg of mangoes = ₹ $265.50 \div 18$
= ₹ 14.75
Hence, she buys mangoes at the rate ₹ 14.75 per kg.
12. A taxi-driver's charges = ₹ 5.40 per km
 \therefore the charge of 26.5 km = ₹ $5.40 \times 26.5 = ₹ 143.10$
Hence, he will have ₹ 143.10 as a charge for journey of 26.5 km.
13. The cost of 8.75 m of cloth = ₹ 420
 \therefore the cost of 1 m of cloth = ₹ $(420 \div 8.75) = ₹ 48$
 \therefore the cost of 2.7 m of cloth = ₹ 48×2.7
= ₹ 129.60
Hence, the cost of 1 m and 2.7 m of cloth is ₹ 48 and ₹ 129.60 respectively.
14. 2.54 cm make = 1 inch
 \therefore 1 cm make = $\frac{1}{2.54}$ inch
 \therefore 60.96 cm make = $\frac{1}{2.54} \times 60.96$ inches
= 24 inches
15. Since, Rajiv's weight = 52.7 kg
 \therefore his father's weight = 2.5 times of Rajeev's weight
= 2.5×52.7 kg
= 131.75 kg
16. Distance covered by a jeep in one litre of petrol = 6.8 km
 \therefore distance covered by a jeep in 10.5 litres of petrol = 6.8×10.5 km
= 71.40 km
Hence, a jeep can travel 71.40 km in 10.5 litres of petrol.
17. Total length of a rope = 45.6 m
Length of each piece = 1.2 m
Number of pieces of rope = ?
Number of pieces of a rope = $45.6 \div 1.2$
= 38
Hence, the length of each piece of the rope is 38.
18. The product of two decimals = 137.41
One decimal = 3.25

$$\begin{aligned} \therefore \text{ other decimal} &= \text{the product of two decimals} \div \text{one decimal} \\ &= 137.41 \div 3.25 \\ &= 42.28 \end{aligned}$$

Hence, the other decimal is 42.28.

19. The required quantity of sugar to bake 9 cakes
 $= 3.204 \text{ kg}$

$$\begin{aligned} \therefore \text{ the required quantity of sugar to bake 1 cake} \\ &= (3.204 \div 9) \text{ kg} \\ &= 0.356 \text{ kg} \end{aligned}$$

Hence, 0.356 kg sugar was used in each cake.

20. The weight of a tin of oil $= 17.5 \text{ kg}$
 \therefore the weight of 43 tins of oil $= 43 \times 17.5 \text{ kg}$
 $= 752.5 \text{ kg}$

Hence, the weight of 43 tins of oil is 752.5 kg.

21. The price of tin of biscuits $= ₹ 70.20$
 \therefore the price of a packet of toffees $= \frac{3}{4}$ th price of tin of biscuits
 $= ₹ \frac{3}{4} \times 70.20$
 $= ₹ 3 \times 17.55$
 $= ₹ 52.65$

The total money spent by Mr Khanna $= ₹ (70.20 + 52.65)$
 $= ₹ 122.85$

22. A dress requires of cloth $= 2.4 \text{ m}$
 \therefore number of dresses $= \text{total length of cloth} \div \text{length of one dress}$
 $= 98.4 \div 2.4 = 41$

Hence, 41 dresses can be made from a piece of cloth measuring 98.4 m.

Exercise 4.8

1. Since, $1 \text{ m} = \frac{1}{1000} \text{ km}$
- $224 \text{ m} = (224 \div 1000) \text{ km} = 0.224 \text{ km}$
 - $990 \text{ m} = (990 \div 1000) \text{ km} = 0.990 \text{ km}$
 - $98 \text{ m} = (98 \div 1000) \text{ km} = 0.098 \text{ km}$
 - $372 \text{ m} = (372 \div 1000) \text{ km} = 0.372 \text{ km}$
 - $2624 \text{ m} = (2624 \div 1000) \text{ km} = 2.624 \text{ km}$
 - $1032 \text{ m} = (1032 \div 1000) \text{ km} = 1.032$

2. Since, $1 \text{ g} = \frac{1}{1000} \text{ kg}$
- $4127 \text{ g} = (4127 \div 1000) \text{ kg} = 4.127 \text{ kg}$
 - $4000 \text{ g} = (4000 \div 1000) \text{ kg} = 4 \text{ kg}$
 - $780 \text{ g} = (780 \div 1000) \text{ kg} = 0.780 \text{ kg}$
 - $339 \text{ g} = (339 \div 1000) \text{ kg} = 0.339 \text{ kg}$
 - $2964 \text{ g} = (2964 \div 1000) \text{ kg} = 2.964 \text{ kg}$
 - $91238 \text{ g} = (91238 \div 1000) \text{ kg} = 91.238 \text{ kg}$

3. Since, $1\text{ l} = \frac{1}{1000}\text{ kl}$

(a) $1309\text{ l} = (1309 \div 1000)\text{ kl} = 1.309\text{ kl}$

(b) $7108\text{ l} = (7108 \div 1000)\text{ kl} = 7.108\text{ kl}$

(c) $1356\text{ l} = (1356 \div 1000)\text{ kl} = 1.356\text{ kl}$

(d) $4208\text{ l} = (4208 \div 1000)\text{ kl} = 4.208\text{ kl}$

(e) $6309\text{ l} = (6309 \div 1000)\text{ kl} = 6.309\text{ kl}$

(f) $6299\text{ l} = (62.99 \div 1000)\text{ kl} = 6.299\text{ kl}$

4. (a) Since, $1\text{ km} = 1000\text{ m}$

So, $2\text{ km} = 2 \times 1000\text{ m} = 2000\text{ m}$

(b) Since, $1\text{ hm} = 100\text{ m}$

So, $5.3\text{ hm} = 5.3 \times 100\text{ m} = 530\text{ m}$

(c) Since, $1\text{ dam} = 10\text{ m}$

So, $23\text{ dam} = 23 \times 10\text{ m} = 230\text{ m}$

(d) Since, $1\text{ km} = 100\text{ dam}$

So, $2.1\text{ km} = 2.1 \times 100\text{ dam} = 210\text{ dam}$

(e) Since, $1\text{ m} = 100\text{ cm}$

So, $4\text{ km} = 4 \times 100\text{ cm} = 400\text{ cm}$

(f) Since, $1\text{ hm} = 1000\text{ dm}$

So, $4.63\text{ hm} = 4.63 \times 1000\text{ dm} = 4630\text{ dm}$

5. (a) Since, $100\text{ m} = 1\text{ hm}$ and $1\text{ m} = \frac{1}{100}\text{ hm}$

So, $2538\text{ m} = 2538 \times \frac{1}{100}\text{ hm} = 25.38\text{ hm}$

(b) Since, $1000\text{ dm} = 1\text{ hm}$ and $1\text{ dm} = \frac{1}{1000}\text{ hm}$

So, $25115\text{ dm} = 25115 \times \frac{1}{1000}\text{ hm} = 25.115\text{ hm}$

(c) Since, $100\text{ cm} = 1\text{ m}$ and $1\text{ cm} = \frac{1}{100}\text{ m}$

So, $250\text{ cm} = 250 \times \frac{1}{100}\text{ m} = 2.50\text{ m}$

(d) Since, $1000\text{ m} = 1\text{ km}$ and $1\text{ m} = \frac{1}{1000}\text{ km}$

So, $4000\text{ m} = 4000 \times \frac{1}{1000}\text{ km} = 4\text{ km}$

(e) Since, $100\text{ dm} = 1\text{ dam}$ and $1\text{ dm} = \frac{1}{100}\text{ dam}$

So, $6253\text{ dm} = 6253 \times \frac{1}{100}\text{ dam} = 62.53\text{ dam}$

(f) Since, $10\text{ cm} = 1\text{ dm}$ and $1\text{ cm} = \frac{1}{10}\text{ dm}$

So, $535\text{ cm} = 535 \times \frac{1}{10}\text{ dm} = 53.5\text{ dm}$

6. (a) Since, $1 \text{ dg} = 100 \text{ mg}$
So, $2.7 \text{ dg} = 2.7 \times 100 \text{ mg} = 270 \text{ mg}$
- (b) Since, $1 \text{ hg} = 1000 \text{ dg}$
So, $8.6 \text{ hg} = 8.6 \times 1000 \text{ dg} = 8600 \text{ dg}$
- (c) Since, $1 \text{ g} = 1000 \text{ mg}$
So, $3.9 \text{ g} = 3.9 \times 1000 \text{ mg} = 3900 \text{ mg}$
- (d) Since, $1 \text{ dag} = 10 \text{ g}$
So, $25 \text{ dag} = 25 \times 10 \text{ g} = 250 \text{ g}$
- (e) Since, $1 \text{ g} = 100 \text{ cg}$
So, $0.82 \text{ g} = 0.82 \times 100 \text{ cg} = 82 \text{ cg}$
- (f) Since, $1 \text{ hg} = 100 \text{ g}$
So, $5.6 \text{ hg} = 5.6 \times 100 \text{ g} = 560 \text{ g}$
7. (a) Since, $10 \text{ hg} = 1 \text{ kg}$ and $1 \text{ hg} = \frac{1}{10} \text{ kg}$
So, $73 \text{ hg} = 73 \times \frac{1}{10} \text{ kg} = 7.3 \text{ kg}$
- (b) Since, $1000 \text{ cg} = 1 \text{ dag}$ and $1 \text{ cg} = \frac{1}{1000} \text{ dag}$
So, $8536 \text{ cg} = 8536 \times \frac{1}{1000} \text{ dag} = 8.536 \text{ dag}$
- (c) Since, $100 \text{ mg} = 1 \text{ dg}$ and $1 \text{ mg} = \frac{1}{100} \text{ dg}$
So, $9360 \text{ mg} = 9360 \times \frac{1}{100} \text{ dg} = 93.60 \text{ dg}$
- (d) Since, $100 \text{ dg} = 1 \text{ dag}$ and $1 \text{ dg} = \frac{1}{100} \text{ dag}$
So, $7365 \text{ dg} = 7365 \times \frac{1}{100} \text{ dag} = 73.65 \text{ dag}$
- (e) Since, $1000 \text{ g} = 1 \text{ kg}$ and $1 \text{ g} = \frac{1}{1000} \text{ kg}$
So, $8000 \text{ g} = 8000 \times \frac{1}{1000} \text{ kg} = 8 \text{ kg}$
- (f) Since, $100 \text{ dag} = 1 \text{ kg}$ and $1 \text{ dag} = \frac{1}{100} \text{ kg}$
So, $9540 \text{ dag} = 9540 \times \frac{1}{100} \text{ kg} = 95.40 \text{ kg}$
8. (a) Since, $1 \text{ da}l = 1000 \text{ cl}$
So, $17 \text{ da}l = 1.7 \times 1000 \text{ cl} = 1700 \text{ cl}$
- (b) Since, $1 \text{ dl} = 100 \text{ ml}$
So, $49 \text{ dl} = 49 \times 100 \text{ ml} = 4900 \text{ ml}$
- (c) Since, $1 \text{ l} = 1000 \text{ ml}$
So, $7.7 \text{ l} = 7.7 \times 1000 \text{ ml} = 7700 \text{ ml}$
- (d) Since, $1 \text{ l} = 100 \text{ cl}$
So, $2.6 \text{ l} = 2.6 \times 1000 \text{ cl} = 260 \text{ cl}$

- (e) Since, $1 \text{ kl} = 1000 \text{ l}$
So, $5 \text{ kl} = 5 \times 1000 \text{ l} = 5000 \text{ l}$
- (f) Since, $1 \text{ hl} = 100 \text{ l}$
So, $8.45 \text{ hl} = 8.45 \times 100 \text{ l} = 845 \text{ l}$
9. (a) Since, $1000 \text{ dl} = 1 \text{ hl}$ and $1 \text{ dl} = \frac{1}{1000} \text{ hl}$
So, $13260 \text{ dl} = 13260 \times \frac{1}{1000} \text{ hl} = 13.260 \text{ hl}$
- (b) Since, $1000 \text{ cl} = 1 \text{ dal}$ and $1 \text{ cl} = \frac{1}{1000} \text{ dal}$
So, $2784 \text{ cl} = 2784 \times \frac{1}{1000} \text{ dal} = 2.784 \text{ dal}$
- (c) Since, $1000 \text{ ml} = 1 \text{ l}$ and $1 \text{ ml} = \frac{1}{1000} \text{ l}$
So, $6428 \text{ ml} = 6428 \times \frac{1}{1000} \text{ l} = 6.428 \text{ l}$
- (d) Since, $100 \text{ dal} = 1 \text{ kl}$ and $1 \text{ dal} = \frac{1}{100} \text{ kl}$
So, $2721 \text{ dal} = 2721 \times \frac{1}{100} \text{ kl} = 27.21 \text{ kl}$
- (e) Since, $100 \text{ l} = 1 \text{ kl}$ and $1 \text{ l} = \frac{1}{1000} \text{ kl}$
So, $5325 \text{ l} = 5325 \times \frac{1}{1000} \text{ kl} = 5.325 \text{ kl}$
- (f) Since, $100 \text{ dal} = 1 \text{ kl}$ and $1 \text{ dal} = \frac{1}{100} \text{ kl}$
So, $7468 \text{ dal} = 7468 \times \frac{1}{100} \text{ kl} = 74.68 \text{ kl}$
10. (a) Since, $1000 \text{ mm} = 1 \text{ m}$ and $1 \text{ mm} = \frac{1}{1000} \text{ m}$
So, $5 \text{ m } 805 \text{ mm} = 5 \text{ m} + 805 \text{ mm} = 5 \text{ m} + 805 \times \frac{1}{1000} \text{ m}$
 $= 5 \text{ m} + 0.805 \text{ m} = 5.805 \text{ m}$
- (b) Since, $1000 \text{ g} = 1 \text{ kg}$ and $1 \text{ g} = \frac{1}{1000} \text{ kg}$
So, $7 \text{ kg } 19 \text{ g} = 7 \text{ kg} + 19 \text{ g} = 7 \text{ kg} + 19 \times \frac{1}{1000} \text{ kg}$
 $= 7 \text{ kg} + 0.019 \text{ kg} = 7.019 \text{ kg}$
- (c) Since, $100 \text{ dm} = 1 \text{ dam}$ and $1 \text{ dm} = \frac{1}{100} \text{ dam}$
So, $2 \text{ dam } 60 \text{ dm} = 2 \text{ dam} + 60 \text{ dm}$
 $= 2 \text{ dam} + 60 \times \frac{1}{100} \text{ dam} = 2 \text{ dam} + 0.60 \text{ dam} = 2.60 \text{ dam}$
- (d) Since, $100 \text{ dam} = 1 \text{ km}$ and $1 \text{ dam} = \frac{1}{100} \text{ km}$

So, 7450 dam = 7400 dam + 50 dam

$$= 7400 \times \frac{1}{100} \text{ km} + 50 \text{ dam} = 74 \text{ km} + 50 \text{ dam} = 74 \text{ km } 50 \text{ dam}$$

(e) Since, 100 cm = 1 m and $1 \text{ cm} = \frac{1}{100} \text{ m}$

$$\begin{aligned} \text{So, } 1512 \text{ cm} &= 1500 \text{ cm} + 12 \text{ cm} = 1500 \times \frac{1}{100} \text{ m} + 12 \text{ cm} \\ &= 15 \text{ m} + 12 \text{ cm} = 15 \text{ m } 12 \text{ cm} \end{aligned}$$

(f) Since, 100 cg = 1 g and $1 \text{ cg} = \frac{1}{100} \text{ g}$

$$\begin{aligned} \text{So, } 878 \text{ cg} &= 800 \text{ cg} + 78 \text{ cg} \\ &= 800 \times \frac{1}{100} \text{ g} + 78 \text{ cg} = 8 \text{ g} + 78 \text{ cg} \\ &= 8 \text{ g } 78 \text{ cg} \end{aligned}$$

MCQs

1. (d) 2. (a) 3. (b) 4. (b) 5. (c)

5

Exponents (Powers)



Exercise 5.1

- 1.
- | | Base | Exponent |
|---------------|------|----------|
| (a) 3^4 | 3 | 4 |
| (b) 6^2 | 6 | 2 |
| (c) $(-1)^5$ | -1 | 5 |
| (d) $(-20)^4$ | -20 | 4 |
| (e) $(-25)^7$ | 25 | 7 |
2. (a) $8 \times 8 \times 8 \times 8 \times 8 = 8^5$ (b) $(-12) \times (-12) \times (-12) \times (-12) = (-12)^4$
(c) $(-24) \times (-24) \times (-24) = (-24)^3$
(d) $5 \times 5 \times 7 \times 7 \times 7 \times 8 \times 8 \times 4 \times 4 = 5^2 \times 7^3 \times 8^2 \times 4^2$
3. (a) $(-1)^{35}$ Since, power of -1 is an odd integer.
So, $(-1)^{35} = -1$
(b) $(-72)^1$ Since, power of -72 is an odd integer.
So, $(-72)^1 = -72$
(c) $(-2)^7$ Since, power of -2 is an odd integer.
So, $(-2)^7 = -128$
(d) $2^4 \times 2^5 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 512$
(e) $(-1)^{65}$ Since, power of -1 is an odd integer.
So, $(-1)^{65} = -1$