

Radiant Mathematics-7

1.The System of Integers

Exercise 1.1

1. (a) $6 \times (-14) = -(6 \times 14) = -84$
(b) $(-300) \times 4 = -(300 \times 4) = -1200$
(c) $(-14) \times (-15) = (-) \times (-) \times 14 \times 15 = +14 \times 15 = 210$
(d) $(-12) \times 12 = -(12 \times 12) = -144$
(e) $62 \times (-9) = -(62 \times 9) = -558$
(f) $(-25) \times (-25) = (-) \times (-) \times 25 \times 25 = +25 \times 25 = 625$
2. (a) $6 \times (-4) \times 3 = (6 \times 3) \times (-4) = 18 \times (-4) = -(18 \times 4) = -72$
(b) $8 \times (-2) \times (-7) = -(8 \times 2) \times (-7) = (-16) \times (-7) = 16 \times 7 = 112$
(c) $(-1) \times (-30) \times 6 = 30 \times 6 = 180$
(d) $(-9) \times (-9) \times (-9) = (-9) \times 81 = -(9 \times 81) = -729$
(e) $0 \times (-3) \times (-271) = 0 \times (-271) = 0$
3. (a) $673 \times 272 - 673 \times 72 = 673 \times (272 - 72)$
 $= 673 \times 200 = 134600$
(b) $(-546) \times (-22) + (-546) \times (-78) = 546 \times 22 + 546 \times 78$
 $= 546 \times 100 = 54600$
(c) $7250 \times (-31) + (-7250) \times 69 = 7250 \times [(-31) + (-1) \times 69]$
 $= 7250 \times [(-31) + (-69)]$
 $= 7250 \times [-100] = -(7250 \times 100)$
 $= -725000$
(d) $199 \times 26743 - (-26743) = 199 \times 26743 + 26743$
 $= 26743 \times (199 + 1)$
 $= 26743 \times 200 = 5348600$
(e) $(-4) \times 20 - (-4) \times 15 - (-4) \times 62 + (-4) \times 97$
 $= (-4) \times [20 - 15 - 62 + 97]$
 $= (-4) \times [(20 - 15) + (97 - 62)]$
 $= (-4) \times [5 + 35] = (-4) \times 40$
 $= -(4 \times 40) = -160$
4. (a) +ve (b) no sign (c) -ve (d) -ve (e) +ve
5. (a) -ve (b) -ve (c) +ve (d) -ve (e) +ve
6. (a) < (b) < (c) < (d) = (e) > (f) =
7. 1. (b) 2. (c) 3. (d) 4. (a)
8. (a) $(-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2)$
 $= [(-2) \times (-2)] \times [(-2) \times (-2)] \times [(-2) \times (-2)]$
 $= 4 \times 4 \times 4 = 64$
The number of negative integers is even, i.e. (6), therefore the product will be in +ve.
(b) $(-2) \times (-2) + (-2) = [(-2) \times (-2)] \times (-2) = 4 + (-2) = -8$
The number of negative integers is odd, i.e. (3), therefore the product will be in -ve.
(c) $(-6) \times 2 + 6 \times (-2) \times -(6 \times 2) + [-(6 \times 2)]$
 $= -12 + (-12)$
 $= -12 - 12 = -24$
(d) $0 \times (-8) \times (-4) \times 3 \times (-4) = 0 \times (-384) = 0$ [$\because a \times 0 = 0$]



Exercise 1.2

1. (a) $16 \div (-4) = 16 \div 4 = 4$
 $\therefore 16 \div (-4) = -4$ (different signs)
- (b) $(-16) \div 4 = 16 \div 4 = 4$
 $\therefore -16 \div 4 = -4$ (different signs)
- (c) $(-16) \div (-4) = 16 \div 4 = 4$
 $\therefore (-16) \div (-4) = 4$ (same sign)
- (d) $0 \div (-8) = 0$
- (e) $(-1000) \div (-10) = 1000 \div 10 = 100$
 $\therefore (-1000) \div (-10) = 100$ (same sign)
- (f) $(-1000) \div 10 = 1000 \div 10 = 100$
 $\therefore (-1000) \div 10 = -100$ (different signs)
- (g) $1000 \div (-10)$
 $1000 \div 10 = 100$
 $\therefore 1000 \div (-10) = -100$ (same sign)
- (h) $601 \div (-1)$
 $601 \div 1 = 601; \therefore 601 \div (-1) = -601$ (different signs)
2. (a) $(-42) \div (-14)$
 $42 \div 14 = 3$
 $\therefore (-42) \div (-14) = 3$ (same sign, i.e. $(-1) \div (-1) = +$)
Check : Here divisor = -14 , quotient = 3
 $\therefore -14 \times 3 = -42$ (dividend), which is correct.
- (b) $(-1) \div (-1)$
 $1 \div 1 = 1$
 $\therefore (-1) \div (-1) = 1$ (same sign, i.e. $(-) \div (-) = +$)
- (c) $0 \div (-5)$
 $0 \div 15 = 0$ [$\because 0 \times a = 0$]
- (d) $110 \div (-11)$
 $110 \div 11 = 10$
 $\therefore 110 \div (-11) = -10$ (different sign, i.e. $(+) \div (-) = -$)
3. (a) T (b) F ($0 \div 4 = 0$) (c) T
(d) T (e) F ($72 \div 0 =$ not defined) (f) F ($-34 \div 17 = -2$)

Exercise 1.3

1. (a) $(-4) \times (-22) \times 4 \times (-3) = 88 \times (-12) = -1056$
and, $(-2) \times (-1) \times (-1) \times (-2) = 2 \times 2 = 4$
 $\therefore 4 > (-1056)$
 $\therefore (-2) \times (-1) \times (-1) \times (-2)$ is greater.
- (b) $7 + 6 \times (-4) = 7 - 24 = -17$
and, $-8 + (-2) \times (-8) \times (-1) = -8 + 16 \times (-1)$
 $= -8 - 16 = -24$
 $\therefore -17 > -24$
 $\therefore 7 + 6 \times (-4)$ is greater.
- (c) $-49 \div -7$ (different signs)
and, $-49 \div -7 = 7$ (same signs)
 $\therefore -49 \div -7$ is greater.

$$(d) (-9) \times 2 \div (-2) \times (7) = (-9) \times [2 \div (-2)] \times (7)$$

$$= (-9) \times (-1) \times (7) = 63$$

$$\text{and, } (9) \times (-2) \div (2) \times 7 = 9 \times [(-2) \div (2)] \times 7$$

$$= 9 \times (-1) \times 7 = 63$$

$$\therefore 63 > -63$$

$\therefore (-9) \times 2 \div (-2) \times (7)$ is greater.

$$(e) 72 \div 9 \times 7 - 64 = (72 \div 9) \times 8 \times 64$$

$$= 8 \times 8 - 64$$

$$= 64 - 64 = 0$$

$$\text{and, } 9 \div 3 \times 12 - 6 = (9 \div 3) \times 12 - 6$$

$$= 3 \times 12 - 6$$

$$= 36 - 6 = 30$$

$$\therefore 30 > 0$$

$\therefore 9 \div 3 \times 12 - 6$ is greater.

2. (a) $64 \div 16 \times (-3) + 2$

$$64 \div 16 \times (-3) + 2 = (64 \div 16) \times (-3) + 2$$

$$= 4 \times (-3) + 2 \quad \text{(division)}$$

$$= -12 + 2 \quad \text{(multiplication)}$$

$$= -10 \quad \text{(subtraction)}$$

(b) We simplify the expression by removing the brackets first.

$$-3 + \{(-4) \div 4 + 1\} + 3 = -3 + \{-1 + 1\} + 3$$

$$= -3 + 0 + 3 = -3 + 3 = 0$$

(c) $6 \div \overline{3 - 2} = 6 \div 1$ (Remove bar first)

$$= 6 \quad \text{(division)}$$

(d) $18 \times (-6 + 4) \div 9 = (-6 + 4) \times (18 \div 9)$ (division)

$$= (-6 + 4) \times 2$$

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

(e) $-5 - (-48) \div (12) + (-2) \times 6$

$$= -5 - [(-48) \div 12] + (-2) \times 6$$

$$= -5 - [(-4)] + (-2) \times 6 \quad \text{(division)}$$

$$= -5 - [(-4) + (-12)] \quad \text{(multiplication)}$$

$$= -5 + 4 - 12 \quad \text{(brackets)}$$

$$= -5 - 8 \quad \text{(subtraction)}$$

$$= -13 \quad \text{(addition)}$$

(f) $-15 + \{4 \div \overline{(-1) - (3)}\} \times 6$

$$= -15 + \{4 \div (-4)\} \times 6 \quad \text{(bar)}$$

$$= -15 + \{(-1)\} \times 6 \quad \text{(division)}$$

$$= -15 + (-6) \quad \text{(multiplication)}$$

$$= -15 - 6 \quad \text{(bracket)}$$

$$= -21 \quad \text{(addition)}$$

(g) $-40 + \overline{(-1) - (-2)} \times 6 \div 3 - 2$

$$= -40 + (-1 + 2) \times 6 \div 1 \quad \text{(bar)}$$

$$= -40 + (1) \times 6 \div 1 \quad \text{(bracket)}$$

$$= -40 + (1) \times 6 \quad \text{(division)}$$

$$= -40 + 6 \quad \text{(multiplication)}$$

$$= -34 \quad \text{(subtraction)}$$

(h) $\{60 \times (-3)\} \div \overline{45 \div (-2)}$
 $= \{60 \times (-3)\} \div (-22.5)$ (bar)
 $= -180 \div (-22.5)$ (curly bracket)
 $= 180 \div 22.5$ (division)
 $= 8$

(i) $7 + 4 - [3 - \{1 + 2 - (4 - 9)\}]$
 $= 7 + 4 - [3 - \{1 + 2 - (-5)\}]$ (First round bracket)
 $= 7 + 4 - [3 - \{1 + 2 + 5\}]$ (Second curly bracket)
 $= 7 + 4 - [3 - 8]$ (Third square bracket)
 $= 7 + 4 - [-5]$ (Addition)
 $= 7 + 4 + 5 = 16$

(j) $-4 \times -1[2 \times (-6) + 3(2 \times 6 - 4 - 2)]$
 $= -4 \times -1[-12 + 3 \times (12 - 6)]$ (round bracket first)
 $= -4 \times -1[-12 + 3 \times 6]$ (multiplication)
 $= -4 \times -1[-12 + 3 \times 6]$ (multiplication)
 $= -4 \times -1[-12 + 18]$ (subtraction)
 $= -4 \times -1[6]$ (multiplication)
 $= -4 \times -6$ (multiplication)
 $= 24$

(k) $120 - 12[3 - 4\{2 \times 3 - 2 \times (-8)\}]$
 $= 120 - 12[3 - 4\{2 \times 3 + 16\}]$ (round bracket first)
 $= 120 - 12[3 - 4 \times 22]$ (subtraction)
 $= 120 - 12[3 - 88]$ (subtraction)
 $= 120 - 12[-85]$ (multiplication)
 $= 120 + 1020$ (addition)
 $= 1140$

(l) $10 + 4 - [3 - \{1 + 2 - (4 - 9)\}]$
 $= 10 + 4 - [3 - \{1 + 2 - (-5)\}]$ (round bracket)
 $= 10 + 4 - [3 - \{1 + 2 + 5\}]$ (curly bracket)
 $= 10 + 4 - [3 - 8]$ (square bracket)
 $= 10 + 4 - [-5]$ (multiplication)
 $= 10 + 4 + 5$ (addition)
 $= 19$

(m) $-4 \times (-2)[2 \times (-6) + 3 \times \overline{(2 \times 6 - 4 - 4)}]$
 $= -4 \times (-2)[2 \times (-6) + 3 \times (12 - 4 - 4)]$ (bar)
 $= -4 \times (-2)[2 \times (-6) + 3 \times 4]$ (round bracket)
 $= -4 \times (-2)[-12 + 12]$ (square bracket)
 $= -4 \times (-2)[0]$ (subtraction)
 $= -4 \times 0$ (multiplication)
 $= 0$ (again multiplication)

(n) $140 - 12 \times [3 - 4\{2 \times 3 - 2 \times (-8)\}]$
 $= 140 - 12 \times [3 - 4\{2 \times 3 + 16\}]$ (bar)
 $= 140 - 12 \times [3 - 4 \times \{22\}]$ (curly bracket)
 $= 140 - 12 \times [3 - 88]$ (multiplication)
 $= 140 - 12 \times [-85]$ (subtraction)
 $= 140 + 1020$ (multiplication)
 $= 1160$ (addition)

$$\begin{aligned}
 \text{(o)} \quad & -80 + 6 \times [-\overline{3 \times 8 + 20}] + 100 \\
 & = -80 + 6 \times [-24 + 20] + 100 && \text{(bar)} \\
 & = -80 + 6 \times [-4] + 100 && \text{(square bracket)} \\
 & = -80 - 24 + 100 && \text{(multiplication)} \\
 & = -24 + (100 - 80) && \text{(subtraction)} \\
 & = -24 + 20 && \text{(subtraction)} \\
 & = -4
 \end{aligned}$$

3. (a) $15 \div 3 + 24 = (15 \div 3) + 24 = 5 + 24 = 29$
 (b) $20 \div 16 - 4 = 20 \div (16 - 4) = 20 \div 4 = 5$
 (c) $8 - 4 \times 20 = [8 - (4 \times 20)] = 8 - 80 = -72$
 (d) $(80 \times (-1) - (-4) \times (-10)) = [80 \times (-1)] - [(-4) \times (-10)]$
 $= [-80 - 40] = -120$
 (e) $6 + 15 + (-20) = 6 + [15 + (-20)] = 6 + [15 - 20] = 6 + [-5] = 6 - 5 = 1$
 (f) $34 \div 10 - 6 = 4 \div (10 - 6) = 4 \div 4 = 1$
 (g) $-15 \times 121(-42) = (-15) \times [12 + (-42)] = (-15) \times [12 - 42]$
 $= (-15) \times (-30) = 450$
 (h) $(-2) \times (-2) + (-9) = [(-2) \times -(-2)] + (-9)$
 $= [-2 \times 2] + (-9) = -4 - 9 = -13$
 (i) $6 + (-24) \div 4 = 6 + [-24 \div 4] = 6 + [-6] = 6 - 6 = 0$
 (j) $(-10) - (0 \times 100 \div 10) = (-10) - [0 \times (100 \div 10)]$
 $= -10 - [0 \times 10] = -10$
4. (a) All the integers between -18 and -25 are as :
 $-19, -20, -21, -22, -23, -24$
 (b) All negative integers greater than -3 and less than 3
 $\Rightarrow -2, -1, 0, 1, 2$
 (c) All positive integers which are opposite in sign to the integers between -5 and 0 .
 $1, 2, 3, 4$ (+ve integers)
 (d) All integers divisible by 5 and lying between 0 and 25 .
 $5, 10, 15, 20$
 (e) All integers that leave a remainder 1 when divided by 2 , and lie between 0 and 10 .
 $3, 5, 7, 9$

Multiple Choice Questions

1. (a) 2. (b) 3. (c) 4. (d) 5. (a) 6. (b) 7. (a) 8. (c) 9. (b) 10. (c)

2. Rational Numbers

Exercise 2.1

1. (a) Nr. = -7 Dr. = 3 (b) Nr. = 12 Dr. = -5
 (c) Nr. = -3 Dr. = 7 (d) Nr. = 16 Dr. = 19
 (e) Nr. = 18 Dr. = 25 (f) Nr. = -3 Dr. = -5
2. (a) $\frac{6}{1} = 6$ (b) $\frac{-10}{1} = -10$ (c) $\frac{30}{1} = 30$
3. (a) $8 - \frac{8}{1} \left(\frac{\text{Nr.}}{\text{Dr.}} \right)$ (b) $-60 = \frac{-60}{1} \left(\frac{\text{Nr.}}{\text{Dr.}} \right)$ (c) $-22 = \frac{-22}{1} \left(\frac{\text{Nr.}}{\text{Dr.}} \right)$



4. (a) T (b) F (c) T
 (d) undefined (e) undefined.
 5. because the number becomes undefined.
 6. No, a and b have to be integers only.

Exercise 2.2

1. (a) $-21, -36$

2. (a) $\frac{6}{7} = \frac{6 \cdot 54}{7 \cdot 63} = \frac{6}{7} \quad \therefore \frac{6}{7} = \frac{54}{63}$ (equal)

(b) $20, 35 \quad \frac{-7}{12} = \frac{-7 \cdot 48}{12 \cdot 84} = \frac{-4}{7} \quad \therefore \frac{-7}{12} \neq \frac{-48}{84}$ (not equal)

(c) $\frac{-9}{11} = \frac{-9 \cdot 27}{11 \cdot 32} = \frac{27}{32} \quad \therefore \frac{-9}{11} \neq \frac{-27}{32}$ (not equal)

(d) $\frac{11}{13} = \frac{11 \cdot 99}{13 \cdot 117} = \frac{11}{13} \quad \therefore \frac{11}{13} = \frac{99}{117}$ (equal)

3. (a) $\frac{-3}{7} = \frac{?}{-21}$; multiply the Nr. and Dr. of $\frac{-3}{7}$ by (-3)

we get $\frac{-3}{7} = \frac{-3 \times (-3)}{7 \times (-3)} = \frac{9}{-21}$

(b) $\frac{-3}{7} = \frac{?}{4^2}$; multiply the Nr. and Dr. of $\frac{-3}{7}$ by 6 ,

we get $\frac{-3}{7} = \frac{-3 \times 6}{7 \times 6} = \frac{-18}{42}$

(c) $\frac{-3}{7} = \frac{?}{14}$; multiply the Nr. and Dr. of $\frac{-3}{7}$ by 2 ,

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

4. (a) $\frac{-3}{8} = \frac{-3 \times 2}{8 \times 2} = \frac{-6}{16}$

$\frac{-3}{8} = \frac{-3 \times 3}{8 \times 3} = \frac{-9}{24}$

$\frac{-3}{8} = \frac{-3 \times 4}{8 \times 4} = \frac{-12}{32}$

$\frac{-3}{8} = \frac{-3 \times 5}{8 \times 5} = \frac{-15}{40}$

$\frac{-3}{8} = \frac{-3 \times 6}{8 \times 6} = \frac{-18}{48}$

(c) $\frac{4}{-15} = \frac{4 \times 2}{-15 \times 2} = \frac{8}{-30} \Rightarrow$

$\frac{4}{-15} = \frac{4 \times 4}{-15 \times 4} = \frac{16}{-60} \Rightarrow$

$\frac{4}{-15} = \frac{4 \times 6}{-15 \times 6} = \frac{24}{-90}$

(b) $\frac{-4}{9} = \frac{-4 \times 2}{9 \times 2} = \frac{-8}{18}$

$\frac{-4}{9} = \frac{-4 \times 3}{9 \times 3} = \frac{-12}{27}$

$\frac{-4}{9} = \frac{-4 \times 4}{9 \times 4} = \frac{-16}{36}$

$\frac{-4}{9} = \frac{-4 \times 5}{9 \times 5} = \frac{-20}{45}$

$\frac{-4}{9} = \frac{-4 \times 6}{9 \times 6} = \frac{-24}{54}$

$\frac{4}{-15} = \frac{4 \times 3}{-15 \times 3} = \frac{12}{-45}$

$\frac{4}{-15} = \frac{4 \times 5}{-15 \times 4} = \frac{20}{-75}$

5. (a) $\frac{5}{6} = \frac{5 \times (-1)}{-6 \times (-1)} = \frac{-5}{6}$ (b) $\frac{3}{-19} = \frac{3 \times (-1)}{-19 \times (-1)} = \frac{-3}{19}$
 (c) $\frac{14}{-25} = \frac{14 \times (-1)}{-25 \times (-1)} = \frac{-14}{25}$ (d) $\frac{-2}{-3} = \frac{-2 \times (-1)}{-3 \times (-1)} = \frac{2}{3}$
 (e) $\frac{0}{-150} = \frac{0 \times (-1)}{-150 \times (-1)} = \frac{0}{50}$

6. (a) $\frac{-2}{5} = \frac{-2 \times (-3)}{5 \times (-3)} = \frac{6}{-15}$ (b) $\frac{3}{17} = \frac{3 \times 2}{17 \times 2} = \frac{6}{34}$

(c) $\frac{12}{44} = \frac{12 \div 2}{44 \div 2} = \frac{6}{22}$

7. (a) $\frac{-2}{7} = \frac{-2 \times (-1)}{-7 \times (-1)} = \frac{2}{7}$

(b) $\frac{-2}{-7} = \frac{-2 \times 2}{-7 \times 2} = \frac{-4}{-14}$

(c) $\frac{-2}{-7} = \frac{-2 \times 9}{-7 \times 9} = \frac{-18}{-63}$

8. (a), (d), (e), (g), (h), (i) negative and (b), (c), (f), positive.

9. (a) $\frac{4}{16} = \frac{4 \div 4}{16 \div 4} = \frac{1}{4}$ [\because H.C.F. of (4, 16) = 4]

(b) $\frac{-6}{-36} = \frac{6 \div 6}{36 \div 6} = \frac{1}{6}$ [\because H.C.F. of (6, 36) = 6]

(c) $\frac{63}{-105} = \frac{63 \div 21}{-105 \div 21} = \frac{3}{-5} = \frac{-3}{5}$ [\because H.C.F. of (63, 105) = 21]

(d) $\frac{-16}{56} = \frac{16 \div 8}{56 \div 8} = \frac{2}{7}$ [\because H.C.F. of (16, 56) = 8]

(e) $\frac{-8}{34} = \frac{-8 \div 2}{34 \div 2} = \frac{-4}{17}$ [\because H.C.F. of (8, 34) = 2]

(f) $\frac{96}{28} = \frac{96 \div 32}{128 \div 32} = \frac{3}{4}$ [\because H.C.F. of (96, 128) = 32]

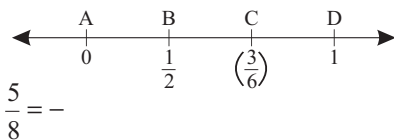
10. (a) $\frac{15}{-8} = \frac{15 \times (-4)}{-8 \times (-4)} = \frac{-60}{32}$ (b) $\frac{15}{-8} = \frac{15 \times 6}{-8 \times 6} = \frac{90}{-48}$

(c) $\frac{15}{8} = \frac{15 \times (-7)}{-8 \times (-7)} = \frac{-105}{56}$ (d) $\frac{15}{-8} = \frac{15 \times 5}{-8 \times 5} = \frac{75}{-40}$

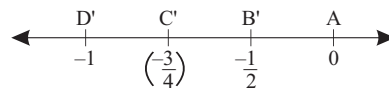
(e) $\frac{15}{8} = \frac{15 \times (-10)}{-8 \times (-10)} = \frac{-150}{80}$ (f) $\frac{15}{8} = \frac{15 \times (-3)}{-8 \times (-3)} = \frac{-195}{104}$

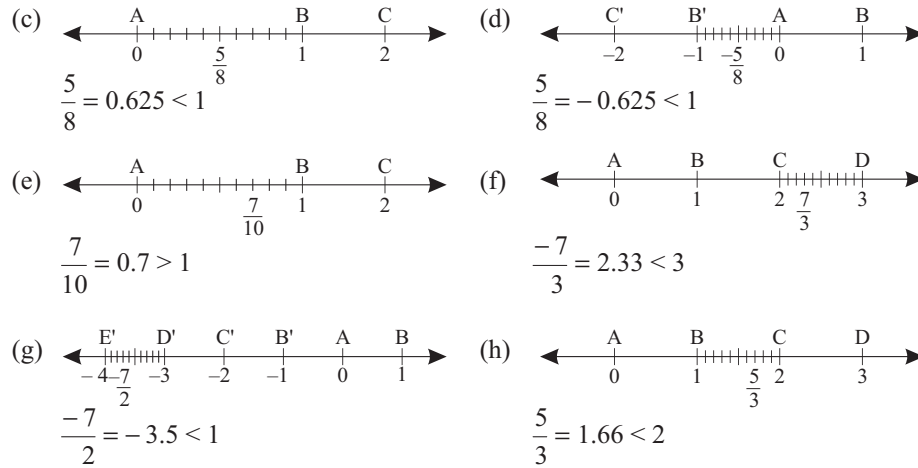
11. (a), (f), (h) are equal, the rest are not equal.

12. (a)



(b)





Exercise 2.3

1. (a) $\frac{-2}{7} + \frac{5}{7} = \frac{-2+5}{7} = \frac{3}{7}$
- (b) $\frac{-16}{3} + \frac{17}{3} = \frac{-16+17}{3} = \frac{-9}{3} = -3$
- (c) $\frac{7}{-11} = \frac{7 \times (-1)}{-11 \times (-1)} = \frac{-7}{11}$
 $\therefore \frac{2}{11} + \frac{7}{-11} = \frac{2}{11} + \frac{(-7)}{11} = \frac{2+(-7)}{11} = \frac{-5}{11}$
- (d) $\frac{5}{-13} = \frac{5 \times (-1)}{-13 \times (-1)} = \frac{-5}{-13}$
 $\therefore -\frac{6}{-13} + \frac{5}{-13} = \frac{-6}{13} + \frac{-5}{3} = \frac{-6+(5)}{13} = \frac{-11}{3}$
- (e) $\frac{-2}{3} + \frac{3}{7} = \frac{-14+9}{21} = \frac{-5}{21}$ [\because The LCM of 3, 7 = 21]
- (f) $\frac{-14}{5} + \frac{7}{3} = \frac{-42+35}{15} = \frac{-7}{15}$ [\because The LCM of 5, 3 = 15]
- (g) $\frac{7}{-15} = \frac{7 \times (-1)}{-15 \times (-1)} = \frac{-7}{15}$
 $\therefore \frac{3}{11} + \frac{7}{-15} = \frac{3}{11} + \frac{(-7)}{15}$
 $= \frac{45-77}{165} = \frac{-32}{165}$ [\because The LCM of 11, 15 = 165]
- (h) $\frac{5}{-2} = \frac{5 \times (-1)}{-2 \times (-1)} = \frac{-5}{2}$ [\because The LCM of 2, 15 = 30]
 $\therefore \frac{-6}{15} + \frac{5}{-2} = \frac{-6}{15} + \frac{(-5)}{2} = \frac{-12-75}{30} = \frac{-87}{30}$

2. (a) $-2 + \frac{3}{8} + \frac{-1}{5} = \frac{-2}{1} + \frac{3}{8} + \frac{-1}{5}$ [\therefore The LCM of 1, 5, 8 = 40]
 $= \frac{-80 + 15 - 8}{40} = \frac{-73}{40}$
- (b) $\frac{2}{3} + \frac{-7}{11} + \frac{-1}{4} = \frac{88 - 84 - 33}{132}$ [\therefore The LCM of 3, 4, 11 = 132]
 $= \frac{-29}{32}$
- (c) $\frac{-9}{7} + \frac{1}{3} + \frac{-3}{4} = \frac{-9 + 3 - 6}{87}$
 $= \frac{-15 + 3}{7} = \frac{-12}{7}$ [\therefore The LCM of 7, 7, 7 = 7]
- (d) $\frac{-9}{7} + \frac{1}{3} + \frac{-3}{4} = \frac{-108 + 28 - 63}{84} = \frac{-143}{184}$ [\therefore The LCM of 3, 4, 7 = 84]

Exercise 2.4

1. (a) $\frac{5}{7} - \frac{3}{7} = \frac{5-3}{7} = \frac{2}{7}$ (b) $\frac{3}{8} - \frac{7}{8} = \frac{3-7}{8} = \frac{-4}{8} = \frac{-1}{2}$
 (c) $\frac{-5}{9} - \frac{7}{9} = \frac{-5-7}{9} = \frac{-12}{9} = \frac{-4}{3}$ (d) $\frac{-3}{11} - \frac{-5}{11} = \frac{-3+5}{11} = \frac{2}{11}$
 (e) $\frac{1}{3} - \frac{-5}{6} = \frac{2+5}{6} = \frac{7}{6}$ (f) $0 - \frac{-9}{-13} + 0 + \frac{9}{13} = \frac{9}{13}$
2. (a) $\frac{-2}{5} - \left(\frac{-7}{9}\right) = \frac{-2}{5} + \frac{7}{9} = \frac{-18 + 35}{45} = \frac{17}{45}$
 (b) $-\left(\frac{-7}{9}\right) = \frac{-1}{1} + \frac{7}{9} = \frac{-9 + 7}{9} = \frac{-2}{9}$
 (c) $0 - \left(\frac{-6}{17}\right) = 0 + \frac{6}{17} = \frac{6}{17}$
 (d) $\frac{-7}{20} - \frac{11}{15} = \frac{-21 - 44}{60} = \frac{-65}{60} = \frac{-13}{12}$
3. Sum of two numbers = $\frac{-3}{7}$, One of the number = $\frac{-5}{8}$.
 \therefore The other number = $\left(\frac{-3}{7}\right) - \left(\frac{-5}{8}\right) = \frac{-3}{7} + \frac{5}{8} = \frac{-24 + 35}{56} = \frac{11}{56}$
4. Sum of two numbers = $\frac{5}{8}$. One of the number = $\frac{-6}{11}$.
 \therefore The other number = $\left(\frac{5}{8}\right) - \left(\frac{-6}{11}\right) = \frac{5}{8} + \frac{6}{11} = \frac{-55 + 48}{88} = \frac{-7}{88}$



5. (a) Sum of two numbers = $\frac{5}{9}$. One of the number = $\frac{-5}{11}$.
 \therefore The other number = $\frac{5}{9} - \left(\frac{-5}{11}\right) = \frac{5}{9} + \frac{5}{11} = \frac{55+45}{99} = \frac{100}{99}$
- (b) Sum of two number = $\frac{-7}{26}$. One of the number = $\frac{6}{13}$
 \therefore The other number = $\frac{-7}{26} - \frac{6}{13} = \frac{-7-12}{26} = \frac{-19}{26}$
- (c) Sum of two numbers = $\frac{-9}{11}$. One of the number = $\frac{-7}{9}$.
 \therefore The other number = $\left(\frac{-9}{11}\right) - \left(\frac{-7}{9}\right) = \frac{-9}{11} + \frac{7}{9} = \frac{-81+77}{99} = \frac{-4}{99}$
6. Sum of two numbers = $\frac{-11}{14}$. One of the number = $\frac{2}{3}$
 \therefore The other second = $\frac{-11}{14} - \frac{2}{3} = \frac{-33-28}{42} = \frac{-61}{42}$
7. Sum of two numbers = $\frac{-1}{4}$. One number = $\frac{-11}{14}$.
 \therefore The Second number = $\frac{-1}{4} + \left(\frac{-11}{14}\right) = \frac{-1}{4} - \frac{11}{14} = \frac{-7-22}{28} = \frac{-29}{28}$
8. $\frac{9}{28} - \left[\left(\frac{-5}{7} + \frac{15}{14}\right)\right] = \frac{9}{28} - \left[\frac{-10+15}{14}\right] = \frac{9}{28} - \frac{5}{14} = \frac{9-10}{28} = \frac{-1}{28}$
9. $\left[\frac{11}{28} + \left(\frac{-3}{7}\right)\right] - \left[\left(\frac{-9}{14} + \frac{5}{7}\right)\right] = \left[\frac{11}{28} - \frac{3}{7}\right] - \left[\frac{-9}{14} + \frac{5}{7}\right] = \left[\frac{11-12}{28}\right] - \left[\frac{-9+10}{14}\right]$
 $= \frac{-1}{28} - \frac{1}{14} = \frac{-1-2}{28} = \frac{-3}{28}$
10. $\left[\left(\frac{4}{5}\right) - \frac{11}{20}\right] + \left(\frac{-9}{10}\right) = \left[\frac{-4}{5} - \frac{11}{20}\right] - \frac{9}{10} = \left[\frac{-16-11}{20}\right] - \frac{9}{10} = \frac{-27}{10} - \frac{9}{10}$
 $= \frac{-27-9}{10} = \frac{-36}{10} = \frac{-18}{5}$
11. Total number of fruits = 240
apples = $\frac{1}{3}$, oranges = $\frac{1}{4}$, bananas = $\frac{1}{5}$
 \therefore Remaining mangoes are = $1 - \left(\frac{1}{3} + \frac{1}{4} + \frac{1}{5}\right)$
 $= 1 - \left(\frac{20+15+12}{60}\right)$ [\because The LCM of 3, 4, 5 = 60]
 $= 1 - \frac{47}{60} = \frac{13}{60}$

$$\text{Thus, apples} = \frac{1}{3} \times \text{Total fruits} = \frac{1}{3} \times 240 = 80$$

$$\text{oranges} = \frac{1}{4} \times \text{Total fruits} = \frac{1}{4} \times 240 = 60$$

$$\text{bananas} = \frac{1}{5} \times \text{Total fruits} = \frac{1}{5} \times 240 = 48$$

$$\text{and mangoes} = \frac{13}{60} \times \text{Total fruits} = \frac{13}{60} \times 240 = 52$$

12. Difference of number = $\frac{-6}{26}$. The greater number = $\frac{-4}{9}$

The smaller number = ?

$$\begin{aligned} \therefore \text{The smaller number} &= \frac{-4}{9} - \left(\frac{-6}{26}\right) = \frac{-4}{9} + \frac{6}{26} = \frac{-104 + 54}{234} \\ &= \frac{-50}{234} = \frac{-25}{117} \end{aligned}$$

13. Let the required rational number be $\frac{a}{b}$

$$\therefore \frac{a}{b} + \left(\frac{-3}{4}\right) = \frac{4}{7}$$

$$\frac{a}{b} = \frac{4}{7} - \left(\frac{-3}{11}\right) = \frac{4}{7} + \frac{3}{11} = \frac{44 + 21}{77} = \frac{65}{77}$$

[\therefore The LCM of 7, 11 = 77]

Exercise 2.5

1. (a) $\frac{1}{2} \times \left(\frac{-3}{4}\right) = \frac{1 \times (-3)}{2 \times 4} = \frac{-3}{8}$

(b) $\frac{2}{3} \times \frac{3}{8} = \frac{\cancel{2} \times 3}{3 \times \cancel{8}} = \frac{1}{4}$

(c) $\frac{3}{11} \times 22 = \frac{3}{11} \times \frac{22}{1} = \frac{3 \times \cancel{22}}{\cancel{11} \times 1} = \frac{3 \times 2}{1 \times 1} = \frac{6}{6} = \frac{1}{1} = 6$

(d) $\frac{-3}{7} \times \frac{11}{21} = \frac{-3 \times 11}{7 \times \cancel{21}} = \frac{-1 \times 11}{7 \times 7} = \frac{-11}{49}$

(e) $\frac{5}{-13} \times \frac{-39}{20} = \frac{\cancel{5} \times (-\cancel{39})}{(-\cancel{13}) \times 20} = \frac{1 \times 3}{1 \times 5} = \frac{3}{5}$

(f) $\frac{-6}{25} \times \frac{50}{24} = \frac{-6 \times 50}{\cancel{25} \times \cancel{24}} = \frac{-6 \times 1}{1 \times 12} = \frac{-6}{12} = \frac{-1}{2}$

(g) $\frac{-4}{7} \times \frac{28}{24} = \frac{-\cancel{4} \times \cancel{28}}{\cancel{7} \times \cancel{24}} = \frac{-\cancel{4}}{\cancel{6}} = \frac{-2}{3}$



$$(h) -1 \times \frac{14}{56} = \frac{-1 \times \cancel{14}^1}{\cancel{56}_4} + \frac{-1 \times 1}{4} = \frac{-1}{4}$$

$$(i) \frac{21}{5} \times \frac{-15}{21} = \frac{21 \times \cancel{(-15)}^3}{\cancel{5} \times \cancel{21}_1} = \frac{-3}{11}$$

$$(j) \frac{-3}{10} \times \frac{-40}{21} = \frac{\cancel{(-3)}^1 \times \cancel{(-40)}^{40}}{\cancel{10}_1 \times \cancel{21}_7} = \frac{-1 \times -4}{1 \times 7} = \frac{4}{7}$$

$$(k) -36 \times \frac{-5}{9} = \frac{\cancel{(-36)}^4 \times (-5)}{\cancel{9}_1} = \frac{(-4) \times (-5)}{1} = \frac{20}{1} = 20$$

$$(l) \frac{-5}{9} \times \frac{-9}{5} = \frac{\cancel{(-5)}^1 \times \cancel{(-9)}^1}{\cancel{9} \times \cancel{5}} = \frac{-1 \times -1}{1 \times 1} = \frac{1}{1} = 1$$

$$2. (a) \frac{3}{25} \times \frac{5}{9} = \frac{\cancel{3}^1 \times \cancel{5}^1}{\cancel{25}_5 \times \cancel{9}_3} = \frac{1 \times 1}{5 \times 3} = \frac{1}{15}$$

$$(b) \frac{5}{27} \times \frac{-3}{20} = \frac{\cancel{5}^1 \times \cancel{(-3)}^1}{\cancel{27}_9 \times \cancel{20}_4} = \frac{1 \times (-1)}{9 \times 4} = \frac{-1}{36}$$

$$(c) \frac{-7}{9} \times \frac{-15}{20} = \frac{(-7) \times \cancel{(-15)}^3}{9 \times \cancel{20}_4} = \frac{(-7) \times \cancel{(-3)}^1}{\cancel{9}_3 \times 4} = \frac{(-7) \times (-1)}{3 \times 4} = \frac{7}{12}$$

$$(d) \frac{-12}{7} \times (-1) = \frac{(-12) \times (-1)}{7} = \frac{12}{7}$$

$$(e) \frac{-3}{8} \times \frac{8}{3} = \frac{\cancel{(-3)}^1 \times \cancel{8}^1}{\cancel{8} \times \cancel{3}} = \frac{(-1) \times 1}{1 \times 1} = \frac{-1}{1} = -1$$

$$(f) -25 \times \frac{-9}{5} = \frac{\cancel{(-25)}^5 \times -9}{\cancel{5}_1} = \frac{(-5) \times (-9)}{1} = \frac{45}{1} = 45$$

Exercise 2.6

$$1. (a) \frac{1}{17} \quad (b) \frac{1}{(-6)} = \frac{-1}{6} \quad (c) \frac{11}{3} \quad (d) \frac{-9}{4}$$

$$(e) \frac{-9}{7} \quad (f) \frac{-13}{3} \quad (g) \frac{99}{5}$$

$$(h) \frac{3}{2} \times \frac{6}{11} = \frac{9}{11} \quad \therefore \text{Its reciprocal} = \frac{1}{\left(\frac{9}{11}\right)} = \frac{11}{9}$$

$$(i) \frac{-5}{8} \times \frac{-3}{11} = \frac{15}{88} \quad \therefore \text{Its reciprocal} = \frac{1}{\left(\frac{15}{88}\right)} = \frac{88}{15}$$

$$(j) \frac{1}{\left(\frac{-2}{11}\right)} = \frac{-11}{2} \quad (k) \frac{1}{\left(\frac{-3}{-5}\right)} = \frac{5}{3} \quad (l) \frac{1}{\left(\frac{-57}{58}\right)} = \frac{58}{-57}$$

$$2. (a) \left(\frac{1}{2}\right)^{-1} = \frac{1}{\left(\frac{1}{2}\right)} = 2 \quad (b) \left(\frac{-3}{2}\right)^{-1} = \frac{1}{\left(\frac{-3}{2}\right)} = \frac{-2}{3}$$

$$(c) \left(\frac{5}{-6}\right)^{-1} = \frac{1}{\left(\frac{5}{-6}\right)} = \frac{-6}{5}$$

$$(d) \left(\frac{3}{2} \times \frac{-2}{3}\right)^{-1} = \left(\frac{3 \times -2}{2 \times 3}\right)^{-1} = \left(\frac{-6}{6}\right)^{-1} = \left(\frac{-1}{1}\right)^{-1} = (-1)^{-1} = \frac{1}{(-1)} = \frac{-1}{1} = -1$$

$$(e) (-11)^{-1} = \frac{1}{(-1)} = \frac{-1}{1} = -1$$

$$3. (a) \frac{2}{5} \div \left(\frac{-3}{7}\right) = \frac{2}{5} \times \left(\frac{7}{-3}\right) = \frac{2 \times 7}{5 \times (-3)} = \frac{14}{-15} = \frac{-14}{15}$$

$$(b) 3 \div \left(\frac{-1}{3}\right) = 3 \times \left(\frac{3}{-1}\right) = \frac{9}{-1} = -9$$

$$(c) -5 \div -15 = -5 \times \frac{1}{-15} = \frac{-5 \times 1}{-15} = \frac{-5}{-15} = \frac{1}{3}$$

$$(d) \frac{-3}{8} \div 8 = \frac{-3}{8} \times \frac{1}{8} = \frac{-3 \times 1}{8 \times 8} = \frac{-3}{64}$$

$$(e) \frac{-3}{8} \div \frac{1}{8} = \frac{-3}{8} \times \frac{8}{1} = \frac{-3 \times 8}{8} = \frac{-3}{1} = -3$$

$$(f) \frac{-3}{13} \div \frac{-5}{39} = \frac{-3}{13} \times \frac{39}{-5} = \frac{-3 \times 39}{13 \times (-5)} = \frac{-3 \times 3}{1 \times (-5)} = \frac{-9}{-5} = \frac{9}{5}$$

$$(g) \frac{49}{7} \div \frac{-7}{9} = \frac{49}{5} \times \frac{9}{-7} = \frac{49 \times 9}{5 \times (-7)} = \frac{7 \times 1}{1 \times (-15)} = \frac{7}{-1} = -7$$



$$(h) \frac{-105}{11} \div \frac{-15}{21} = \frac{-105}{11} \times \frac{121}{(-15)} = \frac{\overset{7}{\cancel{-105}} \times \overset{11}{\cancel{121}}}{\underset{1}{\cancel{11}} \times \underset{1}{\cancel{-15}}} = \frac{7 \times 11}{1 \times 1} = \frac{77}{1} = 77$$

$$4. \text{ The other number} = -6 \div (-8) = -6 \times \left(\frac{1}{-8} \right) = \frac{\overset{3}{\cancel{-6}}}{\underset{4}{\cancel{-8}}} = \frac{3}{4}$$

$$5. \text{ The other number} = \frac{-8}{9} \div \frac{2}{3} = \frac{-8}{9} \times \frac{3}{2} = \frac{\overset{4}{\cancel{-8}} \times \overset{1}{\cancel{3}}}{\underset{3}{\cancel{9}} \times \underset{1}{\cancel{2}}} = \frac{-4 \times 1}{3 \times 1} = \frac{-4}{3}$$

$$6. \text{ The other number} = \frac{16}{3} \div \left(\frac{-4}{3} \right) = \frac{16}{3} \times \left(\frac{-3}{4} \right) = \frac{\overset{4}{\cancel{16}} \times \overset{1}{\cancel{-3}}}{\underset{1}{\cancel{3}} \times \underset{1}{\cancel{4}}} = \frac{4 \times 1}{1 \times (-1)} = \frac{4}{-1} = -4$$

$$7. \text{ The Required number} = \left(\frac{-32}{11} \right) \div \left(\frac{-6}{11} \right) = \frac{-32}{11} \times \left(\frac{11}{-6} \right) = \frac{\overset{16}{\cancel{-32}} \times \overset{1}{\cancel{11}}}{\underset{1}{\cancel{11}} \times \underset{3}{\cancel{-6}}} = \frac{16}{3}$$

$$8. \text{ The Required number} = \left(\frac{-26}{33} \right) \div \left(\frac{13}{11} \right) = \frac{-26}{33} \times \frac{11}{13} = \frac{\overset{2}{\cancel{-26}} \times \overset{1}{\cancel{11}}}{\underset{3}{\cancel{33}} \times \underset{1}{\cancel{13}}} = \frac{-2 \times 1}{3 \times 1} = \frac{-2}{3}$$

$$9. \text{ The Required number} = 13 \div \left(\frac{-91}{5} \right) = 13 \times \frac{5}{-91} = \frac{\overset{1}{\cancel{13}} \times \overset{5}{\cancel{5}}}{\underset{7}{\cancel{-91}}} = \frac{-5}{7}$$

$$10. (i) \left(\frac{13}{15} - \frac{3}{5} \right) \div \left(\frac{13}{5} + \frac{13}{5} \right) = \left(\frac{13-9}{15} \right) \div \left(\frac{13+9}{5} \right) = \left(\frac{44}{15} \right) \div \left(\frac{20}{5} \right) = \frac{\overset{2}{\cancel{44}}}{\underset{15}{\cancel{15}}} \times \frac{\overset{5}{\cancel{5}}}{\underset{11}{\cancel{20}}} = \frac{2}{11}$$

$$(ii) \left(\frac{3}{7} \times \frac{-5}{9} \right) \div \left(\frac{-5}{12} \times \frac{12}{49} \right) = \left[\frac{\overset{1}{\cancel{3}} \times \overset{1}{\cancel{-5}}}{\underset{7}{\cancel{7}} \times \underset{3}{\cancel{9}}} \right] \div \left[\frac{\overset{1}{\cancel{-5}} \times \overset{1}{\cancel{12}}}{\underset{1}{\cancel{12}} \times \underset{49}{\cancel{49}}} \right]$$

$$= \left(\frac{-5}{21} \right) \div \left(\frac{-5}{49} \right) = \frac{\overset{1}{\cancel{-5}}}{\underset{3}{\cancel{21}}} \times \frac{\overset{7}{\cancel{49}}}{\underset{1}{\cancel{-5}}} = \frac{7}{3}$$

11. (a) F (since division by 0 is not defined.)

(b) F (c) T (d) F (e) T (f) F (g) T

MCQ's

1. (c) 2. (b) 3. (b) 4. (b) 5. (c) 6. (b) 7. (b) 8. (d) 9. (d) 10. (a).

3. Fractions

Exercise 3.1

$$1. (a) \frac{4}{7} = \left(\frac{4 \times 2}{7 \times 2}, \frac{4 \times 3}{7 \times 3}, \frac{4 \times 4}{7 \times 4}, \frac{4 \times 5}{7 \times 5} \right) = \frac{8}{14}, \frac{12}{21}, \frac{16}{28}, \frac{20}{35}$$

$$(b) \frac{2}{5} = \left(\frac{2 \times 2}{5 \times 2}, \frac{2 \times 3}{5 \times 3}, \frac{2 \times 4}{5 \times 4}, \frac{2 \times 5}{5 \times 5} \right) = \frac{4}{10}, \frac{6}{15}, \frac{8}{20}, \frac{10}{25}$$

$$(c) \frac{3}{8} = \left(\frac{3 \times 2}{8 \times 2}, \frac{3 \times 3}{8 \times 3}, \frac{3 \times 4}{8 \times 4}, \frac{3 \times 5}{8 \times 5} \right) = \frac{6}{16}, \frac{9}{24}, \frac{12}{32}, \frac{15}{40}$$

$$(d) 1\frac{2}{3} = \frac{5}{3} = \left(\frac{5 \times 2}{3 \times 2}, \frac{5 \times 3}{3 \times 3}, \frac{5 \times 4}{3 \times 4}, \frac{5 \times 5}{3 \times 5} \right) = \frac{10}{6}, \frac{15}{9}, \frac{20}{12}, \frac{25}{15}$$

2. (a) $\frac{11}{2} + 2\frac{1}{3} = \frac{11}{2} + \frac{7}{3} = \frac{33+14}{6} = \frac{47}{6} = 7\frac{6}{6}$ [\therefore LCM of 2, 3 = 6]

(b) $\frac{3}{11} + \frac{5}{6} + 1\frac{1}{3} = \frac{3}{11} + \frac{5}{6} + \frac{4}{3}$
 $= \frac{18+55+88}{66} = \frac{161}{66} = 2\frac{99}{66}$ [\therefore LCM of 3, 6, 11 = 66]

(c) $\frac{9}{4} + 1\frac{1}{3} = \frac{3}{8} = \frac{9}{4} + \frac{4}{3} + \frac{3}{8} = \frac{54+32+9}{24} = \frac{95}{24} = 3\frac{23}{24}$ [\therefore LCM of 3, 4, 8 = 24]

(d) $\frac{5}{8} + \frac{13}{5} + 2\frac{1}{15} = \frac{5}{3} + \frac{13}{5} + \frac{31}{15}$
 $= \frac{25+39+31}{15} = \frac{95}{15} = \frac{19}{3} = 6\frac{1}{3}$ [\therefore LCM of 3, 5, 5 = 15]

(e) $8\frac{3}{4} + 10\frac{2}{5} = \frac{35}{4} + \frac{52}{5} = \frac{175+208}{20} = \frac{383}{20} = 19\frac{3}{20}$

(f) $3\frac{4}{5} + 2\frac{3}{10} + 1\frac{1}{15} = \frac{19}{5} + \frac{23}{10} + \frac{16}{15}$
 $= \frac{114+69+32}{30} = \frac{215}{30} = \frac{43}{6} = 7\frac{1}{6}$

3. (a) $\frac{7}{5} - \frac{2}{5} - \frac{7-2}{5} = \frac{5}{5} = 1$

(b) $\frac{9}{2} - \frac{6}{5} = \frac{45-12}{10} = \frac{33}{10}$

(c) $2\frac{5}{9} - \frac{1}{4} = \frac{23}{9} - \frac{1}{4} = \frac{92-9}{36} = \frac{83}{36}$

(d) $\frac{15}{8} - \frac{3}{7} = \frac{105-24}{56} = \frac{81}{56}$

(e) $3\frac{3}{10} - 1\frac{7}{5} = \frac{33}{10} - \frac{22}{5} = \frac{99-44}{30} = \frac{55}{30} = \frac{11}{6}$

(f) $2\frac{5}{9} - 1\frac{7}{15} = \frac{23}{9} - \frac{22}{15} = \frac{115-116}{45} = \frac{49}{45} = 1\frac{4}{45}$

4. (a) $\frac{5}{9} - \frac{7}{12} + \frac{1}{2} = \frac{20-21+18}{36} = \frac{17}{36}$

[\therefore LCM of 2, 9, 12 = 36]

$\therefore 2 \times 2 \times 3 \times 3 = 36$

(b) $8 - 4\frac{1}{2} - 2\frac{1}{4} = \frac{8}{1} - \frac{9}{2} - \frac{9}{4}$
 $= \frac{32-18-9}{4} = \frac{5}{4} = 1\frac{1}{4}$

(c) $8\frac{5}{6} - 3\frac{3}{8} + 1\frac{7}{12} = \frac{53}{6} - \frac{27}{8} + \frac{19}{12}$

| | |
|---|----------|
| 2 | 2, 9, 12 |
| 2 | 1, 9, 6 |
| 3 | 1, 9, 3 |
| 3 | 1, 3, 1 |
| | 1, 1, 1 |

$$= \frac{212 - 81 + 38}{24}$$

$$= \frac{169}{24} = 7 \frac{1}{24}$$

[∵ LCM of 6, 8, 12 = 24]

5. Seema has ribbon = $3\frac{1}{5} = \frac{16}{5}$ m

Seema gave some ribbon to her brother = $1\frac{1}{2} = \frac{3}{2}$ m

$$\begin{aligned} \therefore \text{Remaining ribbon with Seema} &= \frac{16}{5} - \frac{3}{2} \\ &= \frac{32 - 15}{10} = \frac{17}{10} = 1 \frac{7}{10} \text{ m} \end{aligned}$$

6. Distance from Atul's house to his school = $22\frac{1}{3}$ km = $\frac{67}{3}$ km

distance from school to the museum = $6\frac{1}{4}$ km = $\frac{25}{4}$ km

$$\begin{aligned} \therefore \text{Total distance from house to the museum} &= \frac{67}{3} + \frac{25}{4} = \frac{268 + 75}{12} \\ &= \frac{343}{12} = 28 \frac{7}{12} \text{ km} \end{aligned}$$

7. Total time taken by Suman for studies = $5\frac{2}{3}$ hr = $\frac{17}{3}$ hr

Time devoted for (Sci + Math) = $2\frac{4}{5}$ hr = $\frac{14}{5}$ hr

$$\begin{aligned} \therefore \text{Remaining time devoted for other subjects} &= \frac{17}{3} - \frac{14}{5} = \frac{85 - 42}{15} \\ &= \frac{43}{15} = 2 \frac{13}{15} \text{ hr.} \end{aligned}$$

8. Required number = $18 - 7\frac{3}{5} = 18 - \frac{38}{5} = \frac{18}{1} - \frac{38}{5}$

$$= \frac{90 - 38}{5} = \frac{52}{5} = 10 \frac{2}{5}$$

9. Required number = $8\frac{2}{5} - 7\frac{4}{5} = \frac{42}{5} - \frac{39}{5}$

$$= \frac{42 - 39}{5} = \frac{3}{5}$$

10. The size of picture = $7\frac{3}{5}$ cm = $\frac{38}{5}$ cm

and the size of the frame = $7\frac{3}{10}$ cm = $\frac{73}{10}$ cm

$$\begin{aligned} \therefore \text{To at the picture in the frame, the picture should be trimmed by} &= \frac{38}{5} - \frac{73}{10} \\ &= \frac{76 - 73}{10} \\ &= \frac{3}{10} \text{ cm} \end{aligned}$$



Exercise 3.2

1. (a) $\frac{1}{7}$ of 21 = $\frac{1}{7} \times 21 = 3$
- (b) $\frac{2}{5}$ of 35 l = $\frac{2}{5} \times 35 = 14$ l
- (c) $\frac{2}{3}$ of ₹ 81 = $\frac{2}{3} \times 81 = ₹ 54$
- (d) $\frac{3}{4}$ of 24 = $\frac{3}{4} \times 24 = 18$
- (e) $\frac{1}{5}$ of $3\frac{3}{5} = \frac{1}{5} \times \frac{18}{5}$
- (f) $\frac{1}{2}$ of $9\frac{1}{2} = \frac{1}{2} \times \frac{19}{2} = \frac{19}{4} = 4\frac{3}{4}$
- (g) $\frac{1}{10}$ of 360 kg = $\frac{1}{10} \times 360 = 360$ kg
- (h) $\frac{2}{5}$ of $3\frac{3}{4}$ kg = $\frac{2}{5} \times \frac{15}{4} = \frac{3}{2}$
- (i) $\frac{4}{5}$ or ₹ 2 = $\frac{4}{5} \times 2 = \frac{8}{5} = ₹ 1\frac{3}{5}$
2. (a) $\frac{3}{4} \times \frac{4}{3} = 1$
- (b) $\frac{2}{3} \times 3\frac{1}{4} = \frac{2}{3} \times \frac{13}{4} = \frac{13}{6} = 2\frac{1}{6}$
- (c) $\frac{9}{28} \times 4\frac{1}{3} = \frac{9}{28} \times \frac{13}{3} = \frac{39}{28} = 1\frac{11}{28}$
- (d) $\frac{5}{6} \times \frac{12}{25} \times \frac{2}{3} = \frac{12}{3 \times 5} = \frac{4}{5}$
- (e) $2\frac{2}{3} \times 3\frac{3}{4} = \frac{8}{3} \times \frac{15}{4} = 10$
- (f) $1\frac{1}{2} \times 1\frac{1}{3} \times 1\frac{1}{4} = \frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} = \frac{5}{2} = 2\frac{1}{2}$
- (g) $3\frac{1}{3} \times 2\frac{2}{5} \times 1\frac{1}{7} = \frac{10}{3} \times \frac{12}{5} \times \frac{8}{7} = \frac{64}{7} = 8\frac{8}{7}$
- (h) $3\frac{1}{2} \times 3\frac{1}{7} = \frac{68}{3} \times \frac{22}{7} = \frac{1496}{21} = 71\frac{5}{21}$
- (i) $3\frac{1}{2} \times 2\frac{1}{5} \times \frac{25}{35} = \frac{7}{2} \times \frac{11}{5} \times \frac{5}{7} = \frac{11}{2} = 5\frac{1}{2}$
- (j) $40\frac{5}{8} \times 2\frac{2}{5} = \frac{65}{8} \times \frac{12}{5} = \frac{65 \times 3}{2 \times 1} = \frac{195}{2} = 97\frac{1}{2}$
- (k) $5\frac{5}{6} \times 2\frac{1}{7} = \frac{35}{6} \times \frac{15}{7} = \frac{5 \times 5}{2 \times 1} = \frac{25}{2} = 12\frac{1}{2}$
- (l) $18\frac{2}{3} \times 3\frac{3}{8} = \frac{56}{3} \times \frac{27}{8} = \frac{7 \times 9}{1 \times 1} = 63$

$$\begin{aligned}
3. \quad (a) \quad & \frac{2}{3} \times \left[\frac{3}{4} + \frac{2}{3} + \frac{5}{2} \right] = \frac{2}{3} \times \left[\frac{9+8+30}{12} \right] = \frac{2}{3} \times \frac{47}{6} = \frac{47}{9} = 5 \frac{2}{9} \\
(b) \quad & \left[\frac{7}{9} - \frac{5}{27} \right] \times \left[\frac{1}{3} - \frac{5}{18} \right] = \left[\frac{21-5}{27} \right] \times \left[\frac{6-5}{18} \right] = \frac{16}{27} \times \frac{1}{18} = \frac{16}{486} = \frac{8}{243} \\
(c) \quad & \left(11 \frac{1}{4} \times 3 \frac{1}{5} \right) + \left(4 \frac{2}{3} \times 5 \frac{6}{7} \right) = \left(\frac{45}{4} \times \frac{16}{5} \right) + \left(\frac{14}{3} \times \frac{41}{7} \right) \\
& = \frac{36}{1} + \frac{82}{3} = \frac{108+82}{3} = \frac{190}{3} = 63 \frac{1}{3} \\
(d) \quad & \left(6 \frac{2}{5} \times \frac{25}{8} \right) - \left(\frac{4}{3} \times 1 \frac{1}{8} \right) = \left(\frac{32}{5} \times \frac{25}{8} \right) - \left(\frac{4}{3} \times \frac{9}{8} \right) \\
& = \frac{20}{1} - \frac{3}{2} = \frac{40-3}{2} = \frac{37}{2} = 18 \frac{1}{2} \\
(e) \quad & \left(3 \frac{1}{4} \times 3 \frac{1}{5} \right) - \left(\frac{2}{3} - \frac{3}{7} \right) = \left[\left(\frac{13}{4} \times \frac{16}{5} \right) \right] - \left[\left(\frac{14-9}{21} \right) \right] = \frac{52}{5} - \frac{5}{21} \\
& = \frac{1092-25}{105} = \frac{1067}{105} = 10 \frac{17}{105} \\
(f) \quad & \left(\frac{3}{11} + \frac{5}{22} \right) \times \left(\frac{14}{9} + \frac{5}{6} \right) = \left(\frac{6+5}{22} \right) \times \left(\frac{28+15}{18} \right) = \frac{11}{22} \times \frac{43}{18} = \frac{43}{36} = 1 \frac{7}{36} \\
(g) \quad & \left[4 \frac{1}{2} \times 2 \frac{1}{5} \times 2 \frac{2}{3} \right] - \left[\frac{3}{5} - 2 \frac{2}{3} \times 3 \frac{3}{4} \right] = \left(\frac{9}{2} \times \frac{11}{5} \times \frac{8}{3} \right) - \left(\frac{3}{5} - \frac{8}{3} \times \frac{15}{4} \right) \\
& = \frac{132}{5} - \frac{6}{1} = \frac{132-30}{5} = \frac{102}{5} = 20 \frac{2}{5} \\
(h) \quad & \left[\frac{1}{25} \times \frac{2}{24} \right] - \left[\frac{1}{9} \times \frac{1}{25} \right] = \left(\frac{1}{45} \right) - \left(\frac{1}{45} \right) = \frac{1}{45} - \frac{1}{45} = \frac{45-2}{90} = \frac{43}{90}
\end{aligned}$$

Exercise 3.3

1. Length of the playground = $25 \frac{3}{5}$ m = $\frac{128}{5}$ m

Breadth of the playground = $9 \frac{1}{4}$ m = $\frac{37}{4}$ m

Area of the playground = (length \times breadth)

$$= \left(\frac{128}{5} \times \frac{37}{4} \right) = \frac{32 \times 37}{5 \times 1} = \frac{1184}{5} = 236 \frac{4}{5} \text{ m}^2$$



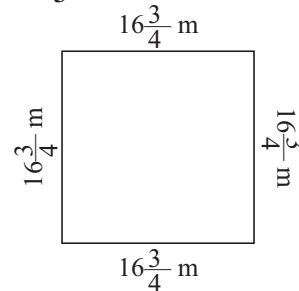
2. Bucket can hold water = $25\frac{3}{4} l = \frac{103}{4} l$

\therefore Water contained in $2\frac{2}{3}$ of the bucket = $2\frac{2}{3}$ of $\frac{103}{4}$
 $= \frac{8}{3} \times \frac{103}{4} = \frac{206}{3} = 68\frac{2}{3} l$

3. Side of square = $16\frac{3}{4} m = \frac{67}{4} m$

Area of the square = (side \times side)
 $= \frac{67}{4} \times \frac{67}{4} = \frac{4489}{16} = 280\frac{9}{16} m^2$

Perimeter of the square = $4 \times$ (side) = $4 \times \left(\frac{67}{4}\right) = 67 m$



4. Distance covered by Amar in 1 hour = $5\frac{1}{3} km = \frac{16}{3} km$

Distance covered in $2\frac{1}{4}$ hr = $2\frac{1}{4} \times \frac{16}{3} = \frac{2}{1} \times \frac{16}{3} = 12 km$

\therefore Amar covers a distance of 12 km in $2\frac{1}{4}$ hours.

5. Weight of 1 bag of cement = $15\frac{2}{3} kg = \frac{37}{3} kg$.

\therefore Weight of $22\frac{4}{7}$ bags of cement = $22\frac{4}{7} \times \frac{37}{3} = \frac{158}{7} \times \frac{37}{3}$
 $= \frac{7426}{21} = 353\frac{13}{21} kg$

6. Abdul can stitch 1 frock in = $\frac{3}{4}$ of an hour = $\frac{3}{4} \times 1 = \frac{3}{4}$ hr.

\therefore Required time taken by Abdul to stitch 24 frocks = $24 \times \frac{3}{4} = 6 \times 3 = 18$ hours

7. The duration of 1 period = $\frac{2}{3}$ hr

\therefore The duration of 9 periods = $9 \times \frac{2}{3} = 3 \times 2 = 6$

8. Cost of 1 m cloth = ₹ $44\frac{4}{5}$

\therefore Cost of $3\frac{3}{4}$ m cloth = $\left(3\frac{3}{4} \times 44\frac{4}{5}\right) ₹ = \frac{15}{4} \times \frac{224}{5} = \frac{3 \times 56}{1 \times 1} = ₹ 168$

9. Total students in the class = 50

\therefore Number of girls = $\frac{3}{5}$ of 50 = $\frac{3}{5} \times \frac{10}{1} \times 5 = 30$

Hence, number of boys = $50 - 30 = 20$

10. Iron rod has been divided equally into = 8 pieces

$$\text{length of 1 piece} = 6\frac{3}{4} = \frac{27}{4} \text{ m}$$

$$\therefore \text{Original length of the iron rod} = 8 \times \left(\frac{27}{4}\right) = 2 \times 27 = \mathbf{54 \text{ m}}$$

11. Length of the field = $16\frac{1}{2} \text{ m} = \frac{33}{2} \text{ m}$

$$\therefore \text{Breadth of the field} = 12\frac{3}{4} \text{ m} = \frac{51}{4} \text{ m}$$

$$\begin{aligned} \therefore \text{Perimeter of the field} &= 2(\text{length} + \text{breadth}) = 2 + \left(\frac{33}{2} + \frac{51}{4}\right) = 2 \times \left(\frac{66 + 51}{4}\right) \\ &= 2 \times \frac{117}{4} = \frac{117}{2} = \mathbf{58\frac{1}{2} \text{ m}} \end{aligned}$$

12. Length of park = $36\frac{3}{5} \text{ m} = \frac{183}{5} \text{ m}$

$$\text{Breadth of park} = 16\frac{2}{3} \text{ m} = \frac{50}{3} \text{ m}$$

$$\begin{aligned} \therefore \text{Area of rectangular park} &= (\text{length} \times \text{breadth}) \text{ m}^2 \\ &= \left(\frac{61}{5} \times \frac{10}{3}\right) = (61 \times 10) = \mathbf{610 \text{ m}^2} \end{aligned}$$

Exercise 3.4

1. (a) $\frac{22}{3}$ (b) $\frac{1}{5}$ (c) $\frac{13}{2}$ (d) $\frac{3}{17}$ (e) -1 (f) $\frac{3}{16}$
2. (a) $5 \rightarrow \frac{1}{5}$ (b) $11 \rightarrow \frac{1}{11}$ (c) $24 \rightarrow \frac{1}{24}$ (d) $\frac{5}{12} \rightarrow \frac{12}{5}$
- (e) $\frac{1}{14} \rightarrow \frac{14}{1} = 14$ (f) $\frac{3}{7} \rightarrow \frac{7}{3}$ (g) $\frac{20}{7} \rightarrow \frac{7}{20}$ (h) $\frac{18}{23} \rightarrow \frac{23}{18}$
- (i) $4\frac{4}{5} = \frac{39}{5} \rightarrow \frac{7}{39}$ (j) $3\frac{9}{11} = \frac{42}{11} \rightarrow \frac{11}{42}$

Exercise 3.5

1. $5 \div \frac{2}{11} = 5 \times \frac{11}{2} = \frac{55}{2} = \mathbf{27\frac{1}{2}}$
2. $6 \div \frac{9}{5} = \frac{6}{9} \times \frac{5}{1} = \frac{10}{3} = \mathbf{3\frac{1}{3}}$
3. $\frac{5}{8} \div 3 = \frac{5}{8} \times \frac{1}{3} = \frac{5}{24}$
4. $\frac{6}{11} \div 15 = \frac{6}{11} \times \frac{1}{15} = \frac{2 \times 1}{11 \times 5} = \frac{2}{55}$
5. $6\frac{4}{5} \div \frac{7}{35} = \frac{34}{5} \times \frac{35}{7} = \frac{34 \times 1}{1 \times 1} = \mathbf{34}$
6. $\frac{16}{7} \div \frac{28}{42} = \frac{16}{7} \times \frac{42}{28} = \frac{4 \times 6}{1 \times 7} = \frac{24}{7} = \mathbf{3\frac{3}{7}}$

- $$7. \frac{8}{27} \div \frac{16}{9} = \frac{\cancel{8}^1}{\cancel{27}_3} \times \frac{\cancel{9}_2^1}{\cancel{16}_2} = \frac{1 \times 1}{3 \times 2} = \frac{1}{6}$$
- $$8. \frac{9}{35} \div \frac{1}{7} = \frac{9}{\cancel{35}_5} \times \frac{\cancel{7}^1}{1} = \frac{9 \times 1}{5 \times 1} = \frac{9}{5} = 1\frac{4}{5}$$
- $$9. \frac{4}{169} \div \frac{8}{13} = \frac{\cancel{4}^1}{\cancel{169}_{13}} \times \frac{\cancel{13}^1}{\cancel{8}_2} = \frac{1 \times 1}{13 \times 2} = \frac{1}{26}$$
- $$10. 25\frac{1}{2} \div \frac{8}{13} = \frac{51}{2} \times \frac{13}{8} = \frac{663}{16} = 41\frac{7}{16}$$
- $$11. \frac{28}{5} \div \frac{4}{35} = \frac{\cancel{28}^7}{\cancel{15}_3} \times \frac{\cancel{35}_7^1}{\cancel{4}_1} = \frac{49}{3} = 16\frac{1}{3}$$
- $$12. \frac{343}{64} \div \frac{7}{8} = \frac{\cancel{343}^{49}}{\cancel{64}_8} \times \frac{\cancel{8}^1}{\cancel{7}_1} = \frac{49}{8} = 6\frac{1}{8}$$
- $$13. \frac{19}{3} \div \frac{8}{13} = \frac{19}{3} \times \frac{13}{8} = \frac{247}{24} = 10\frac{7}{24}$$
- $$14. \frac{21}{102} \div \frac{35}{18} = \frac{\cancel{21}^3}{\cancel{102}_{17}} \times \frac{\cancel{18}^3}{\cancel{35}_5} = \frac{3 \times 3}{17 \times 5} = \frac{9}{85}$$
- $$15. 36\frac{1}{4} \div 8\frac{2}{4} = \frac{145}{4} \div \frac{34}{4} = \frac{145}{\cancel{4}_1} \times \frac{\cancel{4}^1}{34} = \frac{145}{34} = 4\frac{9}{34}$$
- $$16. \left(5\frac{1}{4} \times \frac{16}{7}\right) \div \frac{2}{3} = \left(\frac{\cancel{21}^3}{\cancel{4}_1} \times \frac{\cancel{16}^4}{\cancel{7}_1}\right) \div \frac{2}{3} = \left(\frac{\cancel{12}^6}{\cancel{1}_1}\right) \times \frac{3}{\cancel{2}_1} = \frac{6 \times 3}{1 \times 1} = \frac{18}{1} = 18$$
- $$17. \left(18\frac{2}{9} \div 9\frac{1}{9}\right) \div 1\frac{1}{3} = \left(\frac{164}{9} \div \frac{82}{9}\right) \div \left(\frac{\cancel{164}^2}{\cancel{9}_1} \times \frac{\cancel{9}^1}{\cancel{82}_1}\right) \div \frac{4}{3}$$
- $$= \left(\frac{\cancel{2}^1}{\cancel{1}_1}\right) \times \frac{3}{\cancel{4}_2} = \frac{1 \times 3}{1 \times 2} = \frac{3}{2} = 1\frac{1}{2}$$
- $$18. \left(2\frac{1}{7} \times 2\frac{4}{5}\right) \div \frac{1}{10} = \left(\frac{\cancel{15}^3}{\cancel{7}_1} \times \frac{\cancel{14}^2}{\cancel{5}_1}\right) \div \frac{1}{10} = \frac{6}{1} \times \frac{10}{1} = \frac{60}{1} = 60$$
- $$19. \left[\frac{2}{7} \div \frac{40}{21}\right] \times \left[\frac{3}{10} \div \frac{9}{20}\right] = \left(\frac{\cancel{2}^1}{\cancel{7}_1} \times \frac{\cancel{21}^3}{\cancel{40}_{20}}\right) \times \left(\frac{\cancel{3}^1}{\cancel{10}_5} \times \frac{\cancel{20}^2}{\cancel{9}_3}\right) = \left(\frac{\cancel{3}^1}{\cancel{10}_{10}}\right) \times \left(\frac{\cancel{2}^1}{\cancel{3}_1}\right) = \frac{1}{10}$$
- $$20. \left[\frac{4}{15} \times \frac{6}{28}\right] \times \frac{9}{2} = \frac{\cancel{4}^1 \times \cancel{6}^3 \times \cancel{9}^3}{\cancel{15}_5 \times \cancel{28}_7 \times \cancel{2}_1} = \frac{1 \times 3 \times 3}{5 \times 7 \times 1} = \frac{9}{35}$$
- $$21. \left(24 \div 2\frac{2}{3}\right) \div 3\frac{1}{9} = \left(24 \div \frac{8}{3}\right) \div \frac{28}{9} = \left(\frac{\cancel{24}^3}{\cancel{8}_1} \times \frac{3}{\cancel{8}_1}\right) \div \frac{28}{9} = \frac{9}{9} \times \frac{9}{28} = \frac{81}{28} = 2\frac{25}{28}$$

$$\begin{aligned}
 22. \quad \left[7 \div 2\frac{2}{5}\right] \times \left[\frac{5}{9} \div 9\frac{4}{9}\right] &= \left[7 \div \frac{12}{5}\right] \times \left[\frac{5}{9} \div \frac{85}{9}\right] = \left(7 \times \frac{5}{12}\right) \times \left(\frac{5}{9} \times \frac{9}{85}\right) \\
 &= \frac{7 \times 5 \times \overset{1}{\cancel{5}} \times \overset{1}{\cancel{9}}}{12 \times \overset{1}{\cancel{9}} \times \overset{1}{\cancel{85}}} = \frac{7 \times 5 \times 1 \times 1}{12 \times 1 \times 17} = \frac{35}{204}
 \end{aligned}$$

Exercise 3.6

1. Milkman has milk = $25\frac{1}{5} l = \frac{126}{5} l$

Total bottles filled with this milk = 14

Capacity of each (one) bottle = ?

$$\therefore \text{Capacity of each (one) bottle} = \frac{126}{4} \div 14 = \frac{126}{5} \times \frac{1}{14} = \frac{9}{5} = 1\frac{4}{5} l$$

2. $\therefore 56\frac{4}{7} = \left(\frac{396}{7}\right)$ kg of cement is packed in = 18 bags

$$1 \text{ kg of cement is packed in} = 18 \div \left(\frac{396}{7}\right) = \frac{18 \times 7}{396} \text{ bags}$$

$$\text{and } 78\frac{4}{7} = \left(\frac{550}{7}\right) \text{ kg of cement is packed in} = \left(\frac{550}{7}\right) \times \frac{18 \times \overset{1}{\cancel{7}}}{396} = \frac{550}{22} = 25 \text{ bags}$$

3. Area = $162\frac{1}{2}$ sq.m. = $\frac{325}{2}$ sq.m, length = $16\frac{2}{3} = \frac{50}{3}$ m. breadth = ?

by formula, Area = (length \times breadth)

$$\therefore \text{breadth} = \frac{\text{Area}}{\text{length}} = \left(\frac{325}{2}\right) \div \left(\frac{50}{3}\right) = \frac{325}{2} \times \frac{3}{50} = \frac{13}{2} \times \frac{3}{2} = \frac{39}{4} = 9\frac{3}{4}$$

4. Product of the two numbers = $\frac{4}{9}$, one number = $\frac{7}{17}$

$$\therefore \text{the required number} = \frac{4}{9} \div \frac{7}{17} = \frac{4}{9} \times \frac{17}{7} = \frac{68}{63} = 1\frac{5}{63}$$

$$\therefore \text{The other number is } 1\frac{5}{63}$$

5. Cost of $8\frac{1}{4}$ kg = ₹ $194\frac{1}{4} = ₹ \frac{777}{4}$

$$\text{Cost of 1 kg} = ₹ \frac{777}{4} \div 8\frac{1}{4} = \frac{777}{4} \div \frac{33}{4} = \frac{777}{4} \times \frac{4}{33} = ₹ \frac{259}{11}$$

$$\begin{aligned}
 \therefore \text{Cost of } 3\frac{3}{4} \text{ kg} &= ₹ \frac{259}{11} \times 3\frac{3}{4} = \frac{259}{11} \times \frac{15}{4} \\
 &= \frac{3885}{44} = ₹ 88\frac{13}{44}
 \end{aligned}$$

$$\therefore \text{The cost of } 3\frac{3}{4} \text{ kg of tomatoes in } ₹ 88\frac{13}{44}$$

6. Capacity of the tank = $28\frac{1}{8} l = \frac{225}{8} l$

Capacity of each i.e. (one) Jar = $2\frac{1}{4} = \frac{9}{4} l$

\therefore Required No. of Jars = $\frac{225}{8} \div \frac{9}{4} = \frac{225}{8} \times \frac{4}{9} = \frac{25}{2} = 12\frac{1}{2}$

\therefore $12\frac{1}{2}$ Jars can be filled from a tank of capacity $28\frac{1}{8} l$.

7. Cost of $18\frac{1}{2}$ m of cloth = $\text{₹ } 245\frac{1}{8} = \text{₹ } \frac{1961}{8}$

Cost of 1 m of cloth = $\text{₹ } \frac{1961}{8} \div 18\frac{1}{2} = \frac{1961}{8} \times \frac{2}{37}$

$= \frac{53}{4} \times \frac{2}{37} = \text{₹ } \frac{53}{4}$

Cost of $26\frac{1}{2}$ m of cloth = $\text{₹ } \frac{53}{4} \times \left(26\frac{1}{2}\right) = \frac{53}{4} \times \left(\frac{53}{2}\right) = \frac{2809}{8} = \text{₹ } 351\frac{1}{8}$

\therefore Sameer should pay $\text{₹ } 351\frac{1}{8}$ to the shopkeeper.

8. Cost of $6\frac{1}{2}$ m of lace = $\text{₹ } 115\frac{3}{8}$

Cost of 1 m of lace = $\text{₹ } \left(115\frac{3}{8} \div 6\frac{1}{2}\right) = \frac{923}{8} \times \frac{1}{13} = \frac{71}{4} = \text{₹ } 17\frac{3}{4}$

9. (a) Distance covered by Seher in $9\frac{1}{2}$ hrs. = $432\frac{1}{4}$ km = $\frac{1729}{4}$ km

distance covered by Seher in 1 hr = $\frac{1729}{4} \div 9\frac{1}{2} = \frac{1729}{4} \div \frac{19}{2}$

$= \frac{91}{2} \times \frac{1}{19} = \frac{91}{2}$

\therefore distance covered by Seher $6\frac{1}{2}$ hrs = $\left(6\frac{1}{2}\right) \times \frac{91}{2} = \frac{13}{2} \times \frac{91}{2}$

$= \frac{1183}{4} = 295\frac{3}{4}$ km

(b) \therefore Time taken by Seher to travel $432\frac{1}{4}$ km in = $9\frac{1}{2}$ hrs.

\therefore Time taken by Seher to 1 km = $9\frac{1}{2} \div 432\frac{1}{4}$

\therefore Time taken by Seher to $256\frac{31}{50}$ km = $\left(256\frac{31}{50}\right) \times \left(9\frac{1}{2} \div 432\frac{1}{4}\right)$

$= \left(\frac{12831}{50}\right) \times \left(\frac{19}{2} \div \frac{1729}{4}\right)$

$$= \frac{12831}{50} \times \left(\frac{19}{2} \times \frac{4}{1729} \right)$$

$$= \frac{141}{25} \times \frac{1}{21} = \frac{141}{25} = 5 \frac{16}{25} \text{ hrs}$$

10. Full length of the rope = $58 \frac{13}{20} \text{ m} = \frac{1173}{20} \text{ m}$

No. of pieces of rope are to be cut = 17

$$\therefore \text{ length of each i.e. (one) piece} = \frac{1173}{20} \div 17 = \frac{1173}{20} \times \frac{1}{17} = \frac{69}{20} = 3 \frac{9}{20} \text{ m}$$

11. Total toffees Sumit has $30 \frac{3}{8} \text{ kg} = \frac{243}{8} \text{ kg}$

$$1 \text{ Packet of toffee has toffee} = 2 \frac{1}{40} \text{ kg} = \frac{81}{40} \text{ kg}$$

$$\therefore \text{ Required No. of Packets} = \frac{243}{8} \div \frac{81}{40} = \frac{243}{8} \times \frac{40}{81} = 15$$

12. Perimeter of square = $9 \frac{1}{11} \text{ m} = \frac{100}{11} \text{ m}$

Area of square = ?

$$\text{Area of square} = \left(\frac{\text{Perimeter}}{4} \right)^2 = \left[\left(\frac{100}{11} \right) \div 4 \right]^2 = \frac{25 \times 25}{11 \times 11} = \frac{625}{121} = 5 \frac{20}{21} \text{ m}^2$$

13. Girls = 210 \Rightarrow ratio of girls = $1 - \frac{4}{7} = \frac{7-4}{7} = \frac{3}{7}$

boys = $\frac{4}{7}$ of total students

$$\therefore \text{ Total students} = 210 \div \frac{3}{7} = 210 \times \frac{7}{3} = 490$$

$$\therefore \text{ Ratio of boys} = \frac{4}{7} \times \text{Total students} = \frac{4}{7} \times 490 = 280$$

14. Other number = $15 \frac{5}{6} \div 6 \frac{1}{3} = \frac{95}{6} \div \frac{19}{3} = \frac{95}{6} \times \frac{3}{19} = \frac{5}{2} = 2 \frac{1}{2}$

15. Required number = $42 \div 9 \frac{4}{5} = 42 \div \frac{49}{5} = 42 \times \frac{5}{49} = \frac{30}{7} = 4 \frac{2}{7}$

MCQ's

1. (b) 2. (b) 3. (c) 4. (c) 5. (a) 6. (b) 7. (b) 8. (c) 9. (d) 10. (c)