Universal Maths, Book 7

Detailed Solution

Net Practice—Unit 1

1. -14, -13, -12, -11, -10, -9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14.

   There are 29 integers between -15 and 15.

2. $\left[-65-\left(-54\right)\right]$

   $\left[-65+54\right]$

   -11

   Therefore, successor of -11 will be -10.

3. $\left(-9\right)+\left(-25\right)$

   $\left[-9-25\right]\Rightarrow\left[-34\right]$

   Therefore 13 more than $-34=-34+13=-21$

$\left(-25\right)-\left(-11\right)+9\Leftrightarrow\left(-11\right)-\left(-9\right)+\left(-25\right)$

4. $-25+11+9\Leftrightarrow-11+9-25$

   $-5>-27$

Therefore, (- 25) - (- 11) + 9 > (– 11) - (- 9) + (- 25)

5. Integers whose absolute value is less than 5 are: -4, -3, -2, -1, 0, 1, 2, 3, 4

6. -5 – 37 = -42

Therefore 42 should be subtracted from 37 to get -5.

7. -11 – (-21) = -11 + 21 = 10

Therefore -11 will exceed -21 by 10.

8. Successor of -390 = -389

Predecessor of -119 = -120

Required sum = (-389) + (-120) ≫ -389 -120 = -509

9. - 59 - (– 11) ≫ -59 + 11 = -48

Therefore additive inverse of -48 will be 48.

10. (a) Absolute value of $|-5|$ will be 5

Therefore $|-5| - |-5| = 5 - 5 = 0$

(b) 12 - 6 - [5 - 7– {3 + 6 - (4 - 6)}]

12 - 6 - [5 - 7- {3 + 6 - (4 - 6)}]

$12 - 6 - \left[5 - 7 - \{3 + 6 - (-2)\}\right]$

$12 - 6 - \left[5 - 7 - \{11\}\right] \Rightarrow 12 - 6 - [-13]$

$6 + 13 = 19$

(c) - 3 - [- {– 3 - (– 3 + 3 - 3) - 3}]

- 3 - [- {- 3 - (- 3 + 3 - 3) - 3}]

- 3 - [- {- 3 - (- 3) - 3}]

- 3 - [- {- 3 + 3 - 3}]

$-3 - [3] \Rightarrow -3 - 3 = -6$

(d) $|-15 + 4| - |-(-12) + 3| + |-7|$

$|-15 + 4| - -(-12) + 3 + -7$

$|-11| - |15| + |-7|$

$11 - 15 + 7 \Rightarrow 3$

11.

(a) 0.03 < 0.30
(b) 2.88 > 2.80
(c) 0.07 < 0.7

12.

$\frac{3}{10}, \frac{4}{7}, \frac{2}{5}$

or, 0.3, 0.57, 0.4

or, $0.57 > 0.4 > 0.3$

or, $\frac{4}{7} > \frac{2}{5} > \frac{3}{10}$

13. Simplify:

(*a*) $1\frac{1}{3} + 2\frac{3}{8} \Rightarrow \frac{4}{3} + \frac{19}{8}$

$\frac{32+57}{24} \Rightarrow \frac{89}{24}$ *or* $3\frac{17}{24}$

(*b*) $\frac{1}{2} + \frac{7}{4} - \frac{1}{3}$

$\frac{6+21-4}{12} \Rightarrow \frac{23}{12}$

$1\frac{11}{12}$

(*c*) $\frac{2}{7} + \frac{3}{4} - \frac{5}{6}$

$\frac{24+63-70}{84} \Rightarrow \frac{17}{84}$

(d) 4.8007 + 19.7 + 11.026

Or 35.5267

14. Required number is = 101.11 – 30.38

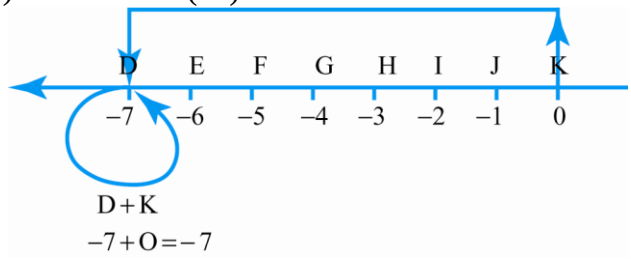
= 70.73

Ch1: Integers

Innings 1.1

1. (a) A + J = (–10) + (–1) = –10 – 1 = –11

(b) D + K = (–7) + 0 = –7

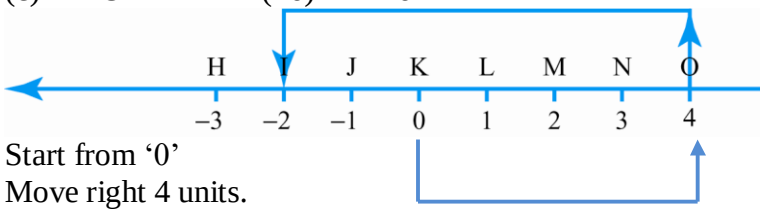


Start from '0'

Move left 7 units.

Move 0 units.

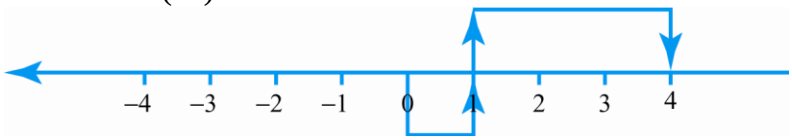
(c) O + E = 4 + (–6) = 4 – 6 = –2



Start from '0'
Move right 4 units.
Move left 6 units.

(d) B –P = = (–9) – 5 = −14

(e) L – H = 1 – (–3) = 1 + 3 = 4.



Start from '0'
Move right 1 unit.
Move right 3 units.

Descending order: 4 > –2 > –7 > –11, –14

2. (a) –2 – (–21)_____–21 + (–2)

LHS

–2 + 21 = 19

RHS

–21 –2 = –23

∴ LHS > RHS.

(b) Additive Inverse of 32_____–45 – (–13).

LHS

Additive Inverse of 32 = –32

RHS

–45 + 13 = –32

∴LHS = RHS

(c) Successor of –75_____Predecessor of additive inverse of –74.

LHS

Successor of –75 = –74

RHS

Additive inverse of –74 = 74.

Predecessor of 74 = 75.

∴ LHS < RHS

(d) Smallest odd positive integer_____Largest odd negative integer.

LHS

Smallest odd positive Integer = 1

RHS

Largest odd negative Integer = – 1

LHS > RHS

3.

(a) 17, 10, 3, –4,_____,_____,_____, _____

As can be seen, '7' is being subtracted from previous numbers.

$\therefore$ 17 –7 = 10; 10 –7 = 3; 3 –7 = – 4

The next four numbers will be:

$\therefore$ –4 –7 = –**11**, –11 –7 = –**18**, –18 –7 = **–25**, –25 –7 = **–32**

(b) –40, –30, –20,_____,_____,_____, _____

As can be seen, '10' is being added to the previous integers.

$\therefore$–40 + 10 = –30; –30 + 10 = –20;

The next four numbers will be:

–20 + 10 = **–10**; –10 + 10 = **0**; 0 + 10 = **10**; 10 + 10 = **20**

(c) 3, 1, –1, –3,_____,_____,_____, _____

As can be seen '2' is being subtracted to the previous integers

$\therefore$ 3 –2 = 1; 1 –2 = – 1; – 1 –2 = – 3

The next four numbers will be:

–3 –2 = **–5**; –5 –2 = **–7**; –7 –2 = **–9**; –9 –2 = **–11**

4. (a) Any two integers whose sum is an integer smaller than both the integers is any two negative integer.

– 1 –2 = – 3 or – 3 –7 = – 10 etc.

Any two negative integers always add up into an integer smaller than both.

(b) Any two integers whose sum is greater than one of the integers is one positive and one negative integer. This is because

2 –3 = – 1; 4 –1 = 3; 5 –4 = 1 etc.

The addition of a positive integer and a negative integer results in the sum being smaller than one integer and bigger than the other.

5. Let the integers be x and y.

Then $x - y = -8$ $\Rightarrow$ $x = -8 + y$

$\therefore$ If $y = 1$ $x = -7$

$y = 2$ $x = -6$

$y = 3$ $x = -5$ and so on.

So (–7, 1) (–6, 2) (–5, 3) …..

6. Predecessor of –157 is – 158

Its absolute value is $|-158| = 158$.

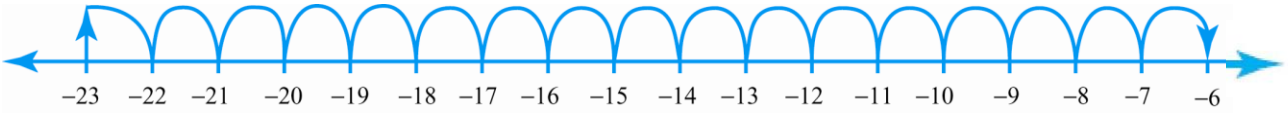
7. Let x be added to –23 to get –7.

Which means $-23 + x = -7$

$\Rightarrow$ $x = -7 + 23$

$\Rightarrow$ $x = 16$.

Using a number line, this can be shown as follows.



= 16 Steps Start from –23 and move one step towards –7. When you reach –7, count the steps taken.
Answer is 16.

8.
The faulty lift climbs up 2 floors at a time, but goes down 1 floor at a time.

So we can count as:
Step 1 Ground to 2^{nd}
Step 2 2^{nd} to 1^{st}
Step 3 1^{st} to 3^{rd}
Step 4 3^{rd} to 2^{nd}
Step 5 2^{nd} to 4^{th}
Step 6 4^{th} to 3^{rd}.
Step 7 3^{rd} to 5^{th}
Step 8 5^{th} to 4^{th}.
Hence, it will take Mrs. Narang 8 attempts to reach the 4^{th} floor.

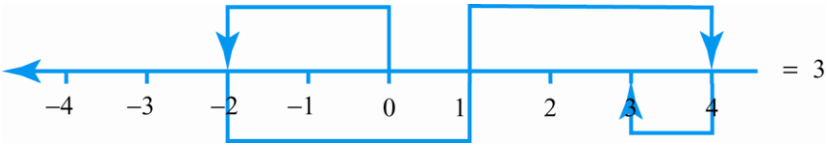
9. Temp. at Shimla = –3°C
Temp. at Jaipur = 39°C.
Difference of temperature is 39°C – (–3°C)
$\Rightarrow$ 39 – (– 3) $\Rightarrow$ 39 + 3 = 42°C

10. The two integers are 0 and 6. 0 + 6 = 6 and 0 − 6 = −6

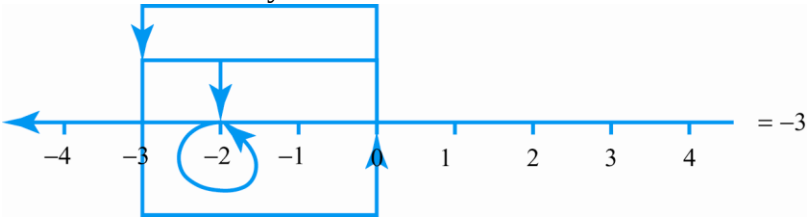
11. Integers on the die –2, –1, 0, 1, 2, 3.

Raman	–2	3	3	–1	0
Shaurya	–2	0	–1	3	–3

Total score of Raman –2 + 3 + 3 – 1 + 0



Total Score of Shaurya –2 + 0 –1 + 3 –3



Raman (3) won the game.

12. Height of building = 64 m
Depth of pit = 12 m
Distance covered be stone = height of building + depth of pit
= 64 m + 12 m
= 76 m

Innings 1.2

1.

(a) 1 is the additive identity for integers. [False]
'0' is the additive identity.

(b) $-7-(-11) = -11-(-7)$ [False]
$-7-(-11) \neq -11-(-7)$

(c) $0-72 = 7$ [False]
$0-72 = -72$.

(d) $-12-(-3)+9 = 0$ [True]

(e) –1 is an integer which is its own additive inverse. [False].
'0' is the integer which is its own additive inverse.

2. (a) $a = 10, b = -2, c = 3$
$a + (b + c) = (a + b) + c$
$10 + (-2 + 3) = (10 - 2) + 3$
$10 - 2 + 3 = 10 - 2 + 3$
$8 + 3 = 8 + 3$
$11 = 11$

(b) $a = -5, \quad b = 5, \quad c = 11$
$a + (b + c) = (a + b) + c$
$-5 + (5 + 11) = (-5 + 5) + 11$
$-5 + 16 = 0 + 11$
$11 = 11$

(c) $a = -100, b = -200, c = -300$

$a + (b + c)$	=	$(a + b) + c$
$-100 + (-200 - 300)$	=	$(-100 - 200) - 300$
$-100 + (-500)$	=	$(-300) - 300$
$-100 - 500$	=	$-300 - 300$
-600	=	-600

3.

(a) $(-12) + 0 = 0 +$ _____ $= -12$
$\Rightarrow$ $(-12) + 0 = 0 + (-12) = -12$ Additive Identity

(b) $(-3) + (-20) = (-20) +$ _____

$\Rightarrow$ $(-3) + (-20) = (-20) + (-3)$ Commutative Property of Addition

(c) $16 + [$_____$+ (-3)\ ] = [16 + (-2)] + (-3)$

$16 + [(-2) + (-3)] = [16 + (-2)] + (-3)$ Associative Property of Addition

(d) $147 +$_____$= 0$

$147 + (-147) = 0$ Additive Inverse

4.

(a) $123 + (-356) + 277 + (-144)$

$= 123 + 277 - 356 - 144$

$= 400 - (356 + 144)$

$= 400 - (500)$

$= 400 - 500 = -100$

(b) $(-14) + (-19) + (-26) + (-21)$

$= -14 - 19 - 26 - 21$

$= -80$(c) $519 + (-93) + 81$

$= 519 + 81 - 93$

$= 600 - 93$

$= 507$

(d) $1009 + (-9) + 225$

$= 1009 + 225 - 9$

$= 1234 - 9$

$= 1225$

5.

(a) $-12 - \{(-1) + (-27) - (-3 - 2)\}$

$= -12 - \{-1 - 27 - (-5)\}$

$= -12 - \{-1 - 27 + 5\}$

$= -12 - \{-23\}$

$= -12 + 23$

$= 11$

(b) $[\{(-125) - (-3)\} - 157 + 6]$

$= [\{(-125 + 3)\} - 157 + 6]$

$= [-122 - 157 + 6]$

$= -279 + 6$

$= -273$

(c) $[\{(-26) - (-15)\} + \{23 + (-17)\}]$

$=[\{-26 + 15\} + \{23 - 17\}]$

$= [\{-11\} + \{6\}]$

$= [-11 + 6] = -5$

(d) $[21 - \{(-75) + 15 - (-75)\} + 135 - (-5)]$

$= [21 - \{-75 + 15 + 75\} + 135 + 5]$

$= [25 - \{15\} + 140]$

$= [25 - 15 + 140]$

$= [10 + 140] = 150$

Innings 1.3

1. (a) $(-25) \times 7$

$= -(25 \times 7)$

$= -([20 + 5] \times 7)$

$= -(20 \times 7 + 5 \times 7)$

$= -(140 + 35)$

$= -175$

(b) $(-8) \times (-15)$

Multiplying the values we get

$15 \times 8 = 120$

No. of negative signs = 2 = Positive

$\therefore 15 \times 8 = 120.$

(c) $(-163) \times 0$

$= 0$

(d) $(-10) \times (-5) \times 8 \times (-4)$

Multiplying the values

$10 \times 5 \times 8 \times 4 = 50 \times 32 = 1600$

No. of negative signs = 3 = Negative

$\therefore (-10) \times (-5) \times 8 \times (-4) = -1600$

(e) $(-12) \times (-2) \times 3$

Multiplying the values

$12 \times 2 \times 3 = 12 \times 6 = 72$

No. of negative signs = 2 = Positive

$\therefore (-12) \times (-2) \times 3 = 72$

(f) $(-1) \times (-2) \times (-53) \times (-5)$

Multiplying the values

$1 \times 2 \times 53 \times 5 = 2 \times 5 \times 53 = 10 \times 53 \Rightarrow 530$

No. of negative signs = 4 = Positive

$\therefore (-1) \times (-2) \times (-53) \times (-5) = 530.$

(g) $(-8) \times (-72) \times (-125)$

Multiplying the values

$8 \times 72 \times 125 = 8 \times 125 \times 72 = 1000 \times 72 = 72000$

No. of negative signs = 3 = Negative

$\therefore (-8) \times (-72) \times (-125) = -72,000.$

(h) $(-5) \times (-4) \times (-3) \times (-2) \times (-1)$

Multiplying the values

$5 \times 4 \times 3 \times 2 \times 1 = 20 \times 6 = 120$

No. of negative signs = 5 = Negative

$\therefore$ $(-5) \times (-4) \times (-3) \times (-2) \times (-1) = -120.$

(i) $(-6) \times 4 \times (-25)$

Multiplying the values

$6 \times 4 \times 25 = 6 \times 100 = 600$

No. of negative signs = 2 = Positive

$\therefore$ $(-6) \times 4 \times (-25) = 600.$

(j) $(-13) \times (-5) \times (-2)$

Multiplying the values

$13 \times 5 \times 2 = 13 \times 10 = 130$

No. of negative signs = 3 = Negative

$\therefore$ $(-13) \times (-5) \times (-2) = -130$

2.

(a) $(-166) \times$ __1__ $= (-166)$ Multiplicative Identity

(b) $57 \times 0 =$ __0__ Multiplication with zero

(c) $3 \times [(-5) \times (-2)] = [3 \times$ __(−5)__ $] \times (-2)$ Associative Property

(d) $(-4) \times [5 + (-8)] = (-4) \times 5 + (-4) \times$ __(−8)__ Distributive Property

(e) $(-21) \times 5 + (-7) \times (-21) =$ __(−21)__ $\times [5 + (-7)]$ Distributive Property

3. (a) $a = -2, \quad b = 5, c = -6$

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

$-2 \times [5 - (-6)] = -2 \times 5 - (-2 \times -6)$

$-2 \times [5 + 6] = -10 - (12)$

$-2 \times 11 = -10 - 12$

$-22 = -22$

(b) $a = -15, \quad b = -3, \quad c = 2$

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

$-15 \times (-3 - 2) = -15 \times (-3) - (-15 \times 2)$

$-15 \times (-5) = +45 - (-30)$

$+75 = 45 + 30$

$75 = 75$

4.

(a) $(-75) \times 173 + 173 \times (-25)$

$= 173 \times (-75 - 25)$

$= 173 \times (-100)$

$= -17300$

(b) $(-21) \times 5 + (-7) \times (-21)$

$= (-21) \times [5 + (-7)]$

$= (-21) \times [5 - 7]$

$= -21 \times -2$

$= 42$

(c) $28 \times (-61) - (-272) \times (-61)$

= (– 61) × [28 – (–272)]
= (– 61) × [28 + 272]
= (– 61) × [300]
= – 18300

(d) 25 × (– 109)
= 25 × (– 100 – 9)
= 25 × (– 100) + 25 × (– 9)
= – 2500 + (– 225)
= – 2725

(e) (–61) × 99
= (– 61) × (100 – 1)
= (–61) × 100 + (– 61) × (–1)
= – 6100 + 61
= – 6039

(f) (– 225) × (– 199) – (– 225)
= (– 225) × [– 199 – 1]
= (– 225) × [– 200]
= 45000

(g) (– 27) × (– 201)
= (– 27) × [– 200 – 1]
= (– 27 × – 200) + (– 27 × –1)
= 5400 + 27
= 5427

(h) 162 × (– 92) – (– 162) × (– 5) –162 × 3
= (– 162) × 92 – (– 162) × (– 5) + (– 162) × 3
= (– 162) × [92 – (– 5) + 3]
= (– 162) × [92 + 5+ 3]
= – 162 × 100
= – 16200

5.

(a) 5 Negatives = Negative
13 Positives = Positive
Negative × Positive = Negative

(b) 24 Negatives = Positive
15 Positive = Positive
Positive × Positive = Positive

6.

(a) (–1) Multiplied to itself 32 times = 1

(b) (– 1) Multiplied 11 times = – 1

7. Let the movement towards east be positive and the movement towards west be negative.

16 (east) = + 16

25 (West) = – 25

Length of each step = 28 cm

$\therefore$ $28 \times 16 + 28 \times (-25)$

$= 28 \times (16 - 25)$

$= 28 \times (-9)$

$= -252$ cm

Jisha has moved 252 cm towards the West.

8. Red Fabric = –5 per metre

White Fabric = + 6 per metre(a) 7 m red and 5 m white

$= 7 \times (-5) + 5 \times (6)$

$= -35 + 30$

$= -5$

A loss of Rs 5 Loss(b)30 m white and makes profit of Rs 60.

$\Rightarrow$ Let amount of Red = x

$\therefore$ $30 \times 6 + x \times (-5) = 60$

$\Rightarrow$ $180 - 5x = 60$

$\Rightarrow$ $180 - 60 = 5x$

$\Rightarrow$ $120 = 5x$

$\Rightarrow$ $x = \frac{120}{5} = 24$ m

24 m of Red Fabric.

9. Sumit earns Rs 3000 per day.

Sumit spends Rs 570 on petrol per day.

$\therefore$ Net saving per day = 3000 –570

= Rs 2430

$\therefore$ Net saving per week = 2430 × 7

= Rs 17010

10. Total questions = 100

Correct answer = 3 marks Non –attempt = 0 marks

Wrong answer = –1 marks

(a) Did not attempt 16 questions and got 70 correct and 14 in correct.

$\therefore$ $16 \times 0 + 70 \times 3 + 14 \times (-1)$

$\Rightarrow$ $0 + 210 - 14$

$\Rightarrow$ 196

She will be ranked above 500.

Innings 1.4

1.

(a) $(-75) \div 0 = 0$

$\Rightarrow$ $(-75) \div 0$ = Undefined.

or

$0 \div (-75) = 0$

(b) $(-63) \div (-9) = -7$

$\Rightarrow \quad (-63) \div (-9) = 7$

(c) $(-12) \div (252) = -21$

$\Rightarrow \quad 252 \div (-12) = -21$

(d) $(-179) \div (-1) = -179$

$\Rightarrow (-179) \div (1) = -179$

(e) $1 \div (-565) = -565$

$\Rightarrow \quad (-565) \div 1 = -565$

(f) $(12 \div 4) \div 3 = 12 \div (4 \div 3)$

$\Rightarrow \quad (12 \div 4) \div 3 = 12 \div (4 \times 3)$

(g) $(-126) \div 9 = -24$

$\Rightarrow \quad (-216) \div 9 = -24$

(h) $360 \div (-45) = 18$

$\Rightarrow 360 \div (20) = 18$

2.

(a) $[66 + (-1)] \div [9 - (-4)]$

$= [66 - 1] \div [9 + 4]$

$= \quad 65 \div 13$

$= \quad 5$

(b) $400 \div \{40 - (-2) - 3 - (-1)\}$

$= \quad 400 \div \{40 + 2 - 3 + 1\}$

$= \quad 400 \div \{40\}$

$= \quad 10$

(c) $(-153) \div [45 \div (-5)]$

$= (-153) \div [-9]$

$= 17$

(d) $[1024 \div (-32)] + [(-125) \div 5]$

$= [-32] + [-25]$

$= -32 - 25$

$= \quad -57$

3.

(a) $a = -24, \quad b = 6, \quad c = 2$

$-24 \div (6 - 2) = -24 \div 6 - (-24 \div 2)$

$-24 \div 4 = -4 - (-12)$

$-6 \quad = -4 + 12$

$-6 \quad \neq \quad 8$

The above equation is invalid.

(b) $a = 64, b = 4, c = -4$

$64 \div [4 - (-4)] = 64 \div 4 - 64 \div (-4)$

$64 \div [4 + 4] = 16 + 16$

$64 \div 8 = 32$

$8 \neq 32$

The above equation is invalid.

4. Red = – Black = +

(a) Product of number = – 24.

If Black = 6

Red = ?

Let Red = x

$\therefore + 6 \times (-x) = -24$

$-x = -4$

$x = 4$

Red die gave the value 4.

(b) Red gives 3 and Black gives 2

$\therefore -3 \times +2 = -6$

(c) $-12 = -2 \times 6 = 6 \times -2$

$= -3 \times 4 = 4 \times -3$

5. Height of the dive = 514 m

Depth of the valley = 62 m

If speed = 18 m/min

Total distance = 514 + 62 = 576 m

Total time = $\frac{576 \text{ m}}{18 \text{ m/min}} = 32$ min.

Innings 1.5

1. $74 + 4 - (-2) + 35 \div 7$

$\Rightarrow 74 + 4 + 2 + 35 \div 7$

$\Rightarrow 74 + 4 + 2 + 5$

$\Rightarrow 85$

2. $1024 \div (-512) + (-56) \div 8 + (-1)$

$\Rightarrow (-2) + (-7) + (-1)$

$\Rightarrow -2 - 7 - 1$

$\Rightarrow -10$

3. $4 \times 9 - (-7) + 10 \div 2 - (-5)$

$\Rightarrow 4 \times 9 + 7 + 10 \div 2 + 5$

$\Rightarrow 4 \times 9 + 7 + 5 + 5$

$\Rightarrow$ $36 + 7 + 10$

$\Rightarrow$ 53

4. $[\{56 \div (-7) - (-17)\} + 5 \times (-7 + 5) - (-3)]$

$\Rightarrow$ $[\{-8 + 17\} + 5 \times (-2) + 3]$

$\Rightarrow$ $[9 + 5 \times -2 + 3]$

$\Rightarrow$ $[9 \div 10 + 3]$

$\Rightarrow$ 25. $[12 - \{3 \times (45 \div (-9))\} + 4 - (-32) + 7]$

$\Rightarrow$ $[12 - \{3 \times (-5)\} + 4 + 32 + 7]$

$\Rightarrow$ $[12 - \{-15\} + 43]$

$\Rightarrow$ $[12 + 15 + 43]$

$\Rightarrow$ 70

5. $[12 - \{3 \times (45 \div (-9)\} + 4 - (-32) + 7]$

$= [12 - \{3 \times (-5)\} + 4 + 32 + 7]$

$= [12 - (-15) + 43]$

$= 12 + 15 + 43$

$= 70$

6. $180 \div \{(72 \div 8) - (-5 + 2 \times 4 + (-3))\}$

$= 180 \div \{9 - (-5 + 2 \times 4 - 3)\}$

$= 180 \div \{9 - (-5 + 8 - 3)\}$

$= 180 \div \{9 - (0)\}$

$= 180 \div 9$

$= 20$

7. $\{20 - (-6 + 60) \div 9 + (24 - (-4) \times 2)\}$

$= \{20 - (54) \div 9 + (24 + 4) \times 2\}$

$= \{20 - 6 + 28 \times 2\}$

$= \{14 + 56\}$

$= 70$

8. $[64 + \{23 - (-14 + 5 \times 12 \div 2 - 6)\}]$

$\Rightarrow [64 + \{23 - \{-14 + 5 \times 6 - 6\}]$

$\Rightarrow [64 + \{23 - \{-14 + 30 - 6\}]$

$\Rightarrow [64 + \{23 - 10\}]$

$\Rightarrow [64 + 13]$

$\Rightarrow 77$

9. $[(2 - 82 \div 41)(342 + 57 - 72 \times 67)]$

$\Rightarrow [(2 - 2)(342 + 57 - 72 \times 67)]$

$\Rightarrow [0 \times (342 + 57 - 72 \times 67)]$

$\Rightarrow 0$

10. $[\{(100 \div 50 - 6) \times 7\} - 80 \div \{24 + (-4)\}]$

$\Rightarrow [\{(2 - 6) \times 7\} - 80 \div \{24 - 4\}]$

$\Rightarrow [\{-4 \times 7\} - 80 \div 20]$

$\Rightarrow [-28 - 4\}$

$\Rightarrow -32$

11. $\{(-42) \div 6 + 51\} \times \{45 - (75 \div 5 + 25 - (-5))\}$

$\Rightarrow$ $\{-7 + 51\} \times \{45 - (15 + 25 + 5)\}$

$\Rightarrow$ $\{44\} \times \{45 - 45\}$

$\Rightarrow$ $\{44\} \times 0$

$= 0$

Chapter Innings

1.

(i) (c)

(ii) (d)

(iii) (a)

(iv) (b)

2. (a) False

(b) False

(c) False

(d) True

3. Let $x = -1$ and $y = +1$

(a) $-x - (-y)$

$= -(-1) - (-1)$

$= 1 + 1 = +2$

Positive

(b) $x \div (-y)$

$= (-1) \div (-1)$

$= +1$

Positive

(c) $(-x) \times (-y)$

$= (-[-1] \times -[1])$

$= +1 \times -1 = -1$

Negative

(d) $x \times (-x) \times y$

$= [-1] \times (-[-1] \times [1])$

$= -1 \times 1 \times 1 = -1$

Negative

4.

(a) $-1024, -512, -256,$_____, _____

$-1024 \div 2 = -512$

$-512 \div 2 = -256$

$-256 \div 2 = -128$

$-128 \div 2 = -64$

(b) $-4, 8, -16, +32,$_____, _____

$-4 \times -2 = 8$

$8 \times -2 = -16$

$-16 \times -2 = 32$

$32 \times -2 = -64$

$-64 \times -2 = 128$

5.

(a) $(-57) - (-57) \times 73 - 28 \times (-57)$

$= (-57) \times [1 - 73 - 28]$

$= (-57) \times [-100]$

$= 5700$

(b) $(-1009) \times 11$

$= (-1000 - 9) \times 11$

$= (-1000 \times 11) + (-9 \times 11)$

$= -11000 - 99$

$= -11099$

(c) $(-219) \times 94 - (-219) \times (-4) + 219 \times (-2)$

$= 219 \times (-94) + 219 \times (-4) + 219 \times (-2)$

$= 219 \times [-94 - 4 - 2]$

$= 219 \times -100$

$= -21900$

(d) $85 \times (-201)$

$= 85 \times (-200 - 1)$

$= (85 \times -200) + (85 \times -1)$

$= -17000 - 85$

$= -17085$

6. Amount of petrol in the car on Monday = 3 + 18 = 21 litres

Daily consumption = 2 litres

Amount refilled on Thursday = 12 litres

Amount left on next Monday morning = 3 litres

Amount of petrol in the car on Monday = 21 *l*

Amount of petrol in the car on Tuesday = 21 – 2 = 19 *l*

Amount of petrol in the car on Wednesday = 19 – 2 = 17 *l*

Amount of petrol in the car on Thursday = 17 – 2 + 12 = 27 *l*

Amount of petrol in the car on Friday = 27 – 2 = 25 *l*

Amount of petrol in the car on Saturday morning = 25 – 2 = 23 *l*

7. Additive inverse of –11 = 11.

21 less than 11

$\Rightarrow$ 11 – 21

$\Rightarrow$ – 10

8. Let the number = x

$\therefore 67 - x = -13$

$67 + 13 = x$

$80 = x$

9. Rate of temperature fall = – 2°C / 5 min
Initial temperature of water = 36°C
Final temperature = 0°

$$\therefore \quad \text{Time taken} = \frac{\text{Final temp - Initial temp}}{\text{Rate of fall of temp}}$$

$$= \frac{0-36}{-2/5\,\text{min}} = 1$$

$$\Rightarrow \quad \frac{-36}{-2} \times 5 = 90 \text{ minutes}$$

10. Let opening balance = x
All credits = 12,000 + 5000 = 17,000
All debits = 7000 + 5000 + 4500 + 1300 + 9500
= 27,300
Closing balance = 56,950
$\therefore$ Opening balance + Credit – Debit = Closing
Opening + 17,000 – 27,300 = 56,950
$\therefore$ Opening = 56,950 – 17,000 + 27,300
= 84250 –17,000
= Rs 67,250

11.

(a) $120 \div 24 - 7 + 6$
$= 5 - 7 + 6$
$= 4$

(b) $63 \div 9 \times 2 + 10 - (-4)$
$= 7 \times 2 + 10 + 4$
$= 14 + 10 + 4$
$= 28$

(c) $[-42 - \{-24 \div (-15 + 3) + (7)\} - (-30) \div (-6)]$
$= [-42 - \{-24 \div -8 + 7\} - 5]$
$= [-42 - \{3 + 7\} - 5]$
$= [-42 - 10 - 5]$
$= -57$

(d) $[124 - \{(48 \div 6 + 4 \times 3 - (-9))\}]$
$= [124 - \{8 + 4 \times 3 + 9\}]$
$= [124 - \{8 + 12 + 9\}]$
$= [124 - 29]$
$= 95$

Mental Maths

1. 24 2. Absolute value 3. 7 4. −15 5. −144

Ch2: Fractions and Decimals

Innings 2.1

1.

(a) $\frac{25}{11}$

To convert into mixed fraction, we divide the numerator by the denominator and then write the entire fraction in due form of

$$\text{Quotient} + \frac{\text{Remainder}}{\text{Denominator}}$$

$$11\overline{)\,25}\quad 2$$

$$\frac{22}{3}$$

Quotient = 2

Remainder = 3

Denominator = 11

$$\therefore \frac{25}{11} = 2\frac{3}{11}$$

(b) $\frac{72}{15}$

$$15\overline{)\,72}\quad 4$$

$$\frac{60}{12}$$

Quotient = 4

Remainder = 12

Denominator = 15

$\therefore \frac{72}{15} = 4\frac{12}{15}$

(c) $\frac{27}{12}$

$$12\overline{)\begin{array}{l}2\\27\\\underline{24}\\3\end{array}}$$

Quotient = 2

Remainder = 3

Denominator = 12

$\therefore \frac{27}{12} = 2\frac{3}{12}$

(d) $\frac{9}{2}$

$$2\overline{)\begin{array}{l}4\\9\\\underline{8}\\1\end{array}}$$

Quotient = 4

Remainder = 1

Denominator = 2

$\therefore \frac{9}{2} = 4\frac{1}{2}$

(e) $\frac{65}{9}$

$$9\overline{)\begin{array}{l}7\\65\\\underline{63}\\2\end{array}}$$

Quotient = 7

Remainder = 2

Denominator = 9

$\therefore \frac{65}{9} = 7\frac{2}{9}$

2.

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

$2\frac{3}{5}$ can be written as $2+\frac{3}{5}$

$$2+\frac{3}{5}=\frac{2\times5+3\times1}{5}=\frac{10+3}{5}=\frac{13}{5}$$

$\therefore 2\frac{3}{5}=\frac{13}{5}$

(b) $4\frac{3}{4}$

$$4\frac{3}{4}=4+\frac{3}{4}=\frac{4\times4+3\times1}{4}=\frac{16+3}{4}=\frac{19}{4}$$

$\therefore\ 4\frac{3}{4}=\frac{19}{4}$

(c) $8\frac{1}{7}$

$8\frac{1}{7}=8+\frac{1}{7}=\frac{8\times 7+1\times 1}{7}=\frac{56+1}{7}=\frac{57}{7}$

$8\frac{1}{7}=\frac{57}{7}$

(d) $2\frac{1}{16}$

$2\frac{1}{6}=2+\frac{1}{6}=\frac{2\times 16+1\times 1}{16}=\frac{32+1}{16}=\frac{33}{16}$

$2\frac{1}{16}=\frac{33}{16}$

(e) $5\frac{7}{12}$

$5\frac{7}{12}=5+\frac{7}{12}=\frac{5\times 12+7\times 1}{12}=\frac{60+7}{12}=\frac{67}{12}$

$5\frac{7}{12}=\frac{67}{12}$

3.

(a) $\frac{5}{13},\frac{6}{13},\frac{9}{13},\frac{1}{13}$

In this case, all the denominators of the given fractions are the same, 13. In such a situation, we need to compare the numerators and the one with the lowest value is the smallest fraction. Therefore,

$\frac{1}{13}<\frac{5}{13}<\frac{6}{13}<\frac{9}{13}$

(b) $\frac{7}{8},\frac{3}{4},\frac{2}{3}$

We first need to take the LCM of the denominators.

$4|\underline{8-4-3}$

$\ \ |\underline{2-1-3}$

= 24

Next, we need to convert the three fractions to have the same denominator.

$\frac{7}{8}\times\frac{3}{3}=\frac{21}{24};$

$\frac{3}{4}\times\frac{6}{6}=\frac{18}{24}$;
$\frac{2}{3}\times\frac{8}{8}=\frac{16}{24}$
Now, we compare the numerators and put them in ascending order.
Therefore
$\frac{2}{3}<\frac{3}{4}<\frac{7}{8}$.

(c) $\frac{8}{9},\frac{7}{11},\frac{3}{14}$
First we take the LCM of the denominators.
$9-11-14$
$9\times11\times14$
$154\times9=1386$
Next, we convert each fraction.
$\frac{8}{9}\times\frac{154}{154}=\frac{1242}{1386}$
$\frac{7}{11}\times\frac{126}{126}=\frac{882}{1386}$
$\frac{3}{14}\times\frac{99}{99}=\frac{297}{1386}$
As can be seen from the numerators, 1242 is the biggest and 297 is the smallest number.
Hence,
$\frac{3}{14}<\frac{7}{11}<\frac{8}{9}$

(d) $\frac{6}{11},\frac{8}{9},\frac{3}{5},\frac{1}{2}$
Again we take LCM of the denominator
$11\times9\times5\times2$
$\Rightarrow 99\times10\Rightarrow 990$
Now, we will convert the fractions again.
$\frac{6}{11}\times\frac{90}{90}=\frac{540}{990}$
$\frac{8}{9}\times\frac{110}{110}=\frac{880}{990}$
$\frac{3}{5}\times\frac{198}{198}=\frac{594}{990}$
$\frac{1}{2}\times\frac{445}{445}=\frac{445}{990}$
Hence, the fraction

$\frac{880}{990}$ is the biggest and $\frac{445}{990}$ is the smallest.

Therefore

$$\frac{1}{2} < \frac{6}{11} < \frac{3}{5} < \frac{8}{9}$$

4.

(a) $3 + \frac{1}{5}$

$$\frac{3}{1} + \frac{1}{5} = \frac{3\times5+1\times1}{5} = \frac{15+1}{5} = \frac{16}{5}$$

LCM $1 - 5$

$= 5$

(b) $\frac{3}{5} + \frac{2}{7}$

LCM of 5, 7 = 35

$$\frac{3\times7+2\times5}{35} = \frac{21+10}{35} = \frac{31}{35}$$

(c) $\frac{27}{11} + \frac{5}{11}$

$$\frac{27}{11} + \frac{5}{11} = \frac{27\times1+5\times1}{11} = \frac{27+5}{11} = \frac{32}{11}$$

(d) $2\frac{2}{3} + 4\frac{1}{2}$

First we convert each faction into an improper fraction.

$$2\frac{2}{3} = 2 + \frac{2}{3} = \frac{2\times3+2}{3} = \frac{6+2}{3} = \frac{8}{3}$$

$$4\frac{1}{2} = 4 + \frac{1}{2} = \frac{4\times2+1}{2} = \frac{8+1}{2} = \frac{9}{2}$$

$$\frac{8}{3} + \frac{9}{2}$$

LCM of 2 and 3 = 6

$$\frac{8\times2+9\times3}{6} = \frac{16+27}{6} = \frac{43}{6}$$

Then, we finally convert the improper fraction into mixed fraction.

$$6\overline{)\begin{array}{r}7\\43\\42\\\hline 1\end{array}}$$

$= 7\frac{1}{6}$

(e) $7\frac{1}{6} - 3\frac{5}{8}$

$7\frac{1}{6} = 7 + \frac{1}{6} = \frac{7\times 6+1}{6} = \frac{42+1}{6} = \frac{43}{6}$

$3\frac{5}{8} = 3 + \frac{5}{8} = \frac{3\times 8+5}{8} = \frac{24+5}{8} = \frac{29}{8}$

$\frac{43}{6} - \frac{29}{8}$

LCM of 6 and 8 = 24

$\frac{43}{6} - \frac{29}{8} = \frac{43\times 4 - 29\times 3}{24} = \frac{172-87}{24} = \frac{85}{24}$

$$24\overline{)\begin{array}{r}3\\85\\72\\\hline 13\end{array}}$$

$= 3\frac{13}{24}.$

5.

Given:

Length (l) = $12\frac{1}{4}$ cm

Breadth (b) = $10\frac{1}{2}$ cm

Perimeter = 2l + 2b = 2 (l + b)

$\therefore$ l + b = $12\frac{1}{4} + 10\frac{1}{2} = \frac{49}{4} + \frac{21}{2} = \frac{49+21\times 2}{4} = \frac{49+42}{4} = \frac{91}{4}$

Perimeter = $2(l + b) = 2 \times \frac{91}{4} = \frac{91}{2}$ cm.

$$2\overline{)\begin{array}{r}45\\91\\90\\\hline 1\end{array}}$$

∴ Perimeter = $45\frac{1}{2}$ cm.

6. Given:

Perimeter = $6\frac{2}{3}$ cm = $6 + \frac{2}{3} = \frac{6 \times 3 + 2}{3} = \frac{18 + 2}{3} = \frac{20}{3}$ cm.

Length (s_1) = $2\frac{1}{2}$ cm = $\frac{5}{2}$ cm

Length (s_2) = $3\frac{1}{3}$ cm = $\frac{10}{3}$ cm.

The perimeter of a triangle = side (s_1) + side (s_2) + side (s_3)

∴ Perimeter = $s_1 + s_2 + s_3$

$$\begin{aligned}
\Rightarrow S_3 &= \text{perimeter} - (s_1 + s_2) \\
&= \frac{20}{3} - \left(\frac{5}{2} + \frac{10}{3}\right) \\
&= \frac{20}{3} - \left(\frac{15 + 20}{6}\right) = \frac{20}{3} - \left(\frac{35}{6}\right) \\
&= \frac{20 \times 2 - 35 \times 1}{6} = \frac{40 - 35}{6} = \frac{5}{6}\text{cm}
\end{aligned}$$

∴ Length of the third side is $\frac{5}{6}$ cm

7.

Length of one lace (l_1) = $7\frac{2}{3}$ cm = $\frac{23}{3}$ cm

3 3

Length of the second lace (l_2) = $8\frac{1}{6}$cm = $\frac{49}{6}$cm

The total lace used (l_3) = $12\frac{1}{3}$cm = $\frac{37}{3}$cm

∴ Amount of lace left = $l_1 + l_2 - l_3$

$$= \frac{23}{3} + \frac{49}{6} - \frac{37}{3}$$
$$= \frac{23\times 2 + 49\times 1 - 37\times 2}{6}$$
$$= \frac{46+49-74}{6} = \frac{95-74}{6} = \frac{21}{6} = 3\frac{3}{6}\text{cm}$$

Amount of lace left = $3\frac{3}{6}$cm.

Innings 2.2

1.

(a) $\frac{15}{32}\times 18$

$15 = 3\times 5$

$18 = 2\times 3\times 3$

$32 = 2\times 2\times 2\times 2\times 2$

$$\therefore \frac{3\times 5}{2\times 2\times 2\times 2\times \underline{2}} \times \underline{2} \times 3\times 3 = \frac{135}{16}$$

(b) $\frac{2}{3}\times 21$

$21 = 3\times 7$

$$\therefore \frac{2}{\underline{3}} \times \underline{3} \times 7 = 14$$

(c) $2\frac{3}{8}\times 25$

$$2\frac{3}{8} = 2 + \frac{3}{8} = \frac{19}{8}$$
$$\frac{19}{8}\times 25 = \frac{475}{8}$$

(d) $2\frac{2}{7}\times 35$

$2\frac{2}{7}=2+\frac{2}{7}=\frac{16}{7}$

$35=5\times 7$

$\frac{16}{7}\times 5\times 7=80$

(e) $\frac{4}{9}\times 10$

$\frac{4\times 10}{9}=\frac{40}{9}$

(f) $3\frac{3}{4}\times 6$

$3\frac{3}{4}=3+\frac{3}{4}=\frac{15}{4}$;

$6=2\times 3$

$\frac{15}{\frac{4}{2}}\times\frac{2}{}\times 3=\frac{45}{2}$

(g) $7\frac{1}{3}\times 3$

$7\frac{1}{3}=7+\frac{1}{3}=\frac{22}{3}$

$\frac{22}{\frac{3}{}}\times\frac{3}{}=22$

(h) $16\frac{3}{4}\times 15$

$16\frac{3}{4}=16+\frac{3}{4}=\frac{67}{4}$

$\frac{67}{4}\times 15=\frac{1005}{4}$

(i) $3\frac{5}{14}\times 21$

$3\frac{5}{14}=3+\frac{5}{14}=\frac{47}{14}$

$21 = 3 \times 7$

$\frac{47}{14_{2}} \times 3 \times \frac{7}{} \Rightarrow \frac{141}{2}$

(j) $5 \times 6\frac{3}{4}$

$6\frac{3}{4} = 6 + \frac{3}{4} = \frac{27}{4}$

$\therefore \frac{27}{4} \times 5 = \frac{135}{4}$

2. (a) (i) $\frac{1}{2}$ of $26 = \frac{1}{2} \times 26 = \frac{1}{2} \times \frac{2}{} \times 13 = 13$

(ii) $\frac{1}{2}$ of $18 = \frac{1}{2} \times 2 \times 3 \times 3 = 9$

(iii) $\frac{1}{2}$ of $58 = \frac{1}{2} \times \frac{2}{} \times 29 = 29$

(iv) $\frac{1}{2}$ of $27 = \frac{1}{2} \times 27 = \frac{27}{2}$

(b) (i) $\frac{2}{3}$ of $36 = \frac{2}{3} \times 2 \times 3 \times 2 \times \frac{3}{} = 24$

(ii) $\frac{2}{3}$ of Rs $21 = \frac{2}{3} \times 3 \times 7 =$ Rs 14

(iii) $\frac{2}{3}$ of 1 hour $= \frac{2}{3} \times 1 = \frac{2}{3}$ hour

(iv) $\frac{2}{3}$ of 66 kg $= \frac{2}{3} \times 66 = \frac{2}{3} \times 2 \times \frac{3}{} \times 11 = 44$

(c) (i) $\frac{3}{4}$ of 1 dozen $= \frac{3}{4} \times 12 = \times \frac{4}{} \times 3 = 9$ (1 dozen = 12)

$\frac{3}{4}$

(ii) $\frac{3}{4}$ of 3 dozens $= \frac{3}{4} \times 3 \times 12 =$ $\times 3 \times 3 \times$ $= 27$

(iii) $\frac{3}{4}$ of 1 day $= \frac{3}{4} \times 1\text{day} = \frac{3}{4}\text{day}$

(iv) $\frac{3}{4}$ of 54 m $= \frac{3}{4} \times 54 = \frac{3}{\frac{4}{2}} \times \frac{2}{} \times 3 \times 3 \times 3 = \frac{81}{2}$.

3.

Weight of one packet of biscuits $= 2\frac{4}{5}$ kg $= \frac{14}{5}$ kg

Weight of 25 packets is $25 \times \frac{14}{5} = \frac{14}{5} \times 5 \times \frac{5}{} = 70$ kg

4.

No. of people = 40

(a)

No. of people for ice-cream $= \frac{1}{2}$ of 40 $= \frac{1}{2} \times \frac{2}{} \times 2 \times 2 \times 5$

$= 20$

(b)

No. of people for cold-drinks $= \frac{2}{5}$ of 40 $= \frac{2}{5} \times 2 \times 2 \times 2 \times \frac{5}{}$

$= 16$

No. of people for iced tea $= 40 - (20 + 16)$

$= 40 - 36$

$= 4$

(c) Fraction of total number of people asking for iced tea $= \frac{4}{40} = \frac{4}{4 \times 10} = \frac{1}{10}$.

5.

Length of each strip $= 3\frac{2}{3}$ m $= \frac{11}{3}$ m

Total number of strips = 6

$\therefore$ Total length $= \frac{11}{3} \times 6 = \frac{11}{3} \times 2 \times \frac{3}{} = 22$ m

Innings 2.3

1.

(a) $\frac{26}{35}\times\frac{10}{13}=\frac{2\times\cancel{13}}{\cancel{5}\times 7}\times\frac{2\times\cancel{5}}{\cancel{13}}=\frac{4}{7}$

(b) $3\frac{4}{7}\times\frac{9}{10}=\frac{25}{7}\times\frac{9}{10}=\frac{5\times\cancel{5}}{7}\times\frac{9}{2\times\cancel{5}}=\frac{45}{14}=3\frac{3}{14}$

(c) $12\frac{1}{2}\times 3\frac{1}{2}=\frac{25}{2}\times\frac{7}{2}=\frac{175}{4}=43\frac{3}{4}$

(d) $8\frac{1}{2}\times 4\frac{2}{7}=\frac{17}{2}\times\frac{30}{7}=\frac{17}{\cancel{2}}\times\frac{\cancel{2}\times 3\times 5}{7}=\frac{255}{7}=36\frac{3}{7}$

(e) $2\frac{1}{3}\times 1\frac{1}{2}\times 1\frac{1}{6}=\frac{7}{\cancel{3}}\times\frac{\cancel{3}}{2}\times\frac{7}{6}=\frac{49}{12}=4\frac{1}{12}$

(f) $\frac{13}{56}\times\frac{8}{65}=\frac{\cancel{13}}{\cancel{8}\times 7}\times\frac{\cancel{8}}{\cancel{13}\times 5}=\frac{1}{35}$

(g) $15\frac{2}{5}\times 4\frac{3}{7}=\frac{77}{5}\times\frac{31}{7}=\frac{11\times\cancel{7}}{5}\times\frac{31}{\cancel{7}}=\frac{341}{5}=68\frac{1}{5}$

(h) $1\frac{1}{14}\times 1\frac{2}{7}\times 3\frac{2}{3}=\frac{15}{14}\times\frac{\overset{3}{\cancel{9}}}{7}\times\frac{11}{\cancel{3}}=\frac{495}{98}=5\frac{5}{98}$

2.

(a) $5\frac{1}{3}\times 5\frac{1}{4}-\frac{1}{6}\times 1\frac{1}{2}$

$=\frac{16}{3}\times\frac{21}{4}-\frac{1}{6}\times\frac{3}{2}=\frac{4\times\cancel{4}}{\cancel{3}}\times\frac{\cancel{3}\times 7}{\cancel{4}}-\frac{1}{\cancel{3}\times 2}\times\frac{\cancel{3}}{2}=28-\frac{1}{4}=$

$=\frac{28\times 4-1}{4}=\frac{112-1}{4}=\frac{111}{4}=27\frac{3}{4}$

(b) $1\frac{2}{3} \times 2\frac{3}{5} + 1\frac{2}{3} \times \frac{1}{5}$

$= \frac{5}{3} \times \frac{13}{5} + \frac{5}{3} \times \frac{1}{5}$

$= \frac{13}{3} + \frac{1}{3} = \frac{13+1}{3} = \frac{14}{3} = 4\frac{2}{3}$

(c) $\frac{42}{65} \times \frac{39}{27} \times \frac{24}{56}$

$= \frac{\overset{2}{\cancel{6} \times \cancel{7}}}{5 \times \cancel{13}} \times \frac{\cancel{3} \times \cancel{13}}{\cancel{3} \times \underset{3}{\cancel{9}}} \times \frac{\cancel{3} \times \cancel{8}}{\cancel{8} \times \cancel{7}} = \frac{2}{5}$

(d) $4\frac{5}{8} \times 1\frac{1}{3} \times \frac{21}{37} \times 2\frac{1}{7}$

$\frac{37}{8} \times \frac{4}{3} \times \frac{21}{37} \times \frac{15}{7}$

$= \frac{\cancel{37}}{2 \times \cancel{4}} \times \frac{\cancel{4}}{\cancel{3}} \times \frac{\cancel{3} \times \cancel{7}}{\cancel{37}} \times \frac{3 \times 5}{7} = \frac{15}{2} = 7\frac{1}{2}$

3. .

(a) $\frac{2}{3}$ of $\frac{3}{7}$ or $\frac{1}{2}$ of $\frac{6}{7}$?

$= \frac{2}{3} \times \frac{3}{7}$ or $\frac{1}{2} \times \frac{\overset{3}{6}}{7}$

$= \frac{2}{7}$ or $\frac{3}{7}$

Since the denominator is same, the greater numerator is the bigger fraction.

$\frac{3}{7} > \frac{2}{7}$.

(b) $\frac{2}{13}$ of $\frac{8}{15}$ or $\frac{2}{11}$ of $\frac{3}{10}$?

$= \frac{2}{13} \times \frac{8}{15}$ or $\frac{2}{11} \times \frac{3}{\underset{5}{10}}$

$= \frac{16}{195}$ or $\frac{3}{55}$

$5\overline{)195 - 55}$

$\quad\;\; 39 - 11$

$\begin{array}{r} 55 \\ \times\ 39 \\ \hline 2145 \end{array}$

LCM of 195 and 55 = 2145

$\therefore \frac{16}{195} \times \frac{11}{11} = \frac{176}{2145}$

$\therefore \frac{3}{55} \times \frac{39}{39} = \frac{117}{2145}$

Since 176 > 117

$\therefore \frac{16}{195} > \frac{3}{55}$

4.

(a) $\frac{1}{9}$ of $\frac{9}{17} = \frac{1}{9} \times \frac{9}{17} = \frac{1}{17}$

(b) $\frac{2}{9}$ of $4\frac{2}{7} = \frac{2}{9}$ of $\frac{30}{7} = \frac{2}{\underset{3}{\underline{9}}} \times \frac{\underline{3} \times 10}{7} = \frac{20}{21}$

(c) $\frac{3}{8}$ of $9\frac{1}{3} = \frac{3}{8}$ of $\frac{28}{3} = \frac{\cancel{3}}{2 \times \cancel{4}} \times \frac{7 \times \cancel{4}}{\cancel{3}} = \frac{7}{2}$

(d) $\frac{4}{7}$ of $\frac{13}{16} = \frac{4}{7} \times \frac{13}{4 \times \underline{4}} = \frac{13}{28}$

(e) $\frac{4}{5}$ of $3\frac{4}{5} = \frac{4}{\underline{4}} \times \frac{16}{\underline{5}} = \frac{16}{5}$

(f) $\frac{1}{11}$ of $1\frac{7}{15} = \frac{1}{\underline{11}} \times \frac{22}{15} = \frac{1}{\underline{11}} \times \frac{2 \times 11}{15} = \frac{2}{15}$

(g) $\frac{7}{11}$ of $\frac{44}{7} = \frac{\cancel{7}}{\cancel{11}} \times \frac{4 \times \cancel{11}}{\cancel{7}} = 4$

(h) $\frac{2}{3}$ of $\frac{15}{22} = \frac{\cancel{2}}{\cancel{3}} \times \frac{5 \times \cancel{3}}{\cancel{2} \times 11} = \frac{5}{11}$ m

Innings 2.4

1.

(a) $\frac{1}{3} \div \frac{5}{6} = \frac{1}{3} \times \frac{6}{5} = \frac{1}{\underline{3}} \times \frac{2 \times \underline{3}}{5} = \frac{2}{5}$

(b) $\frac{1}{2} \div \frac{3}{4} = \frac{1}{2} \times \frac{4}{3} = \frac{1}{\underline{2}} \times \frac{2 \times \underline{2}}{3} = \frac{2}{3}$

(c) $9 \div \frac{3}{7} = 9 \times \frac{7}{3} = 3 \times \underline{3} \times \frac{7}{\underline{3}} = 21$

(d) $\frac{8}{1} \div 16 = \frac{8}{1} \times \frac{1}{16} = 8 \times \frac{1}{16} = \frac{1}{2}$

$$\frac{9}{9} \quad \frac{9}{16} \quad \frac{}{9} \quad \frac{\cancel{4}\times\cancel{2}}{} \times 4 \quad 36$$

(e) $$13\frac{1}{2} \div 9 = \frac{27}{2} \div 9 = \frac{\overset{3}{\cancel{27}}}{2} \times \frac{1}{\cancel{9}} = \frac{3}{2}$$

(f) $49\frac{1}{2} \div 18 = \frac{99}{2} \div 18 = \frac{99}{2} \times \frac{1}{18} = \frac{9 \times 11}{2} \times \frac{1}{\frac{18}{2}} = \frac{11}{4}$

(g) $147 \div 5\frac{1}{4} = 147 \div \frac{21}{4} = 147 \times \frac{4}{21} = \frac{7 \times \cancel{21} \times 4}{\cancel{21}} = 28$

(h) $3\frac{5}{8} \div 1\frac{5}{24} = \frac{29}{8} \div \frac{29}{24} = \frac{\cancel{29}}{\cancel{8}} \times \frac{\overset{3}{\cancel{24}}}{\cancel{29}} = 3$

(i) $12\frac{2}{7} \div 7\frac{1}{6} = \frac{86}{7} \div \frac{43}{6} = \frac{\overset{2}{86}}{7} \times \frac{6}{43} = \frac{12}{7}$

(j) $1\frac{2}{3} \div 3\frac{4}{7} = \frac{5}{3} \div \frac{25}{7} = \frac{5}{3} \times \frac{7}{5 \times 5} = \frac{7}{15}$

(k)

2. .

Product of two fractions $= 68\frac{3}{5} = \frac{343}{5}$

One number = 21

Other number = ?

(One number) × (other number) = $\frac{343}{5}$

$\therefore$ Other number $= \frac{343}{5} \div 21 = \frac{343}{5} \times \frac{1}{21} = \frac{7 \times 49}{5} \times \frac{1}{21_3}$

$= \frac{49}{15}$

3.

$$\text{cost of } \frac{1}{4} \text{ kg of basmati} = \text{Rs } 150$$

$$\therefore \text{cost of 1 kg} = \text{Rs } 150 \div \frac{1}{4}$$

$$= \text{Rs } 150 \times 4$$

$$\text{cost of } 3\frac{1}{2} \text{ kg of rice} = \text{Rs } 600$$

$$\text{cost of } 3\frac{1}{2} \text{ kg of rice} = 600 \times 3\frac{1}{2}$$

$$= \overset{300}{\cancel{600}} \times \frac{7}{\cancel{2}}$$

$$\text{cost} = 2100$$

4.

$$\text{Area of rectangle} = 13\frac{3}{5} = \frac{68}{5} \text{ m}^2$$

$$\text{Length of rectangle} = 4\frac{6}{7} = \frac{34}{7} \text{ m.}$$

$$\text{Breadth} = ?$$

$$\text{Area} = \text{Length} \times \text{Breadth}$$

$$\text{Breadth} = \frac{\text{Area}}{\text{Length}} = \frac{68}{5} \div \frac{34}{7} = \frac{\overset{2}{\cancel{68}}}{5} \times \frac{7}{\cancel{34}} = \frac{14}{5} \text{ m}$$

5.

No. of people in hall = 216

Fraction occupied = $\frac{3}{7}$ of total capacity

$\therefore \frac{3}{7}$ of total capacity = 216

$\therefore$ total capacity = $216 \div \frac{3}{7}$

= $^{72}\underline{216} \times \frac{7}{\underline{3}} = 504$

Total capacity = 504

6.

Sum of $\frac{65}{12}$ and $\frac{8}{3} = \frac{65}{12} + \frac{8}{3} = \frac{65 + 8 \times 4}{12}$

$= \frac{65 + 32}{12} = \frac{97}{12}$

Difference of $\frac{65}{12}$ and $\frac{8}{3} = \frac{65}{12} - \frac{8}{3} = \frac{65 - 8 \times 4}{12}$

$= \frac{65 - 32}{12} = \frac{33}{12}$

Division:

$\frac{97}{12} \div \frac{33}{12} = \frac{97}{\underline{12}} \times \frac{\underline{12}}{33} = \frac{97}{33}$

7.

Distance covered by bus = 44 km

Time taken = $3\frac{2}{3}$ hours

\Distance covered in 1 hour = $44\text{km} \div 3\frac{2}{3}\text{hr}$

= $44\text{km} \div \frac{11}{3}\text{hr}$

= $\overset{4}{\cancel{44}} \times \frac{3}{\cancel{11}} = 12\text{km}$

8.

Distance travelled = 48 km

Time taken = $1\frac{1}{3}\text{ hr} = \frac{4}{}\text{ hr}$

Distance in 1 hour = $48 \div \frac{4}{3} = \overset{12}{\cancel{48}} \times \frac{3}{\cancel{4}} = 36\text{ km}$

9.

Length of one piece = $\frac{3}{4}$ m

Total length = $25\frac{1}{2}$ m = $\frac{51}{2}$ m

No. of piece = $\frac{51}{2} \div \frac{3}{4}$ = $\frac{\overset{17}{\cancel{51}}}{\cancel{2}} \times \frac{\overset{2}{\cancel{4}}}{\cancel{3}}$ = 34 pieces

Innings 2.5

1.

(a) $\frac{13}{25}$

$25 \times 4 = 100$

$\therefore \frac{13 \times 4}{25 \times 4} = \frac{52}{100} = 0.52$

(b) $\frac{3}{20}$

$20 \times 5 = 100$

$\therefore \frac{3 \times 5}{20 \times 5} = \frac{15}{100} = 0.15$

(c) $\frac{109}{250}$

$250 \times 4 = 1000$

$\therefore \frac{109 \times 4}{250 \times 4} = \frac{436}{1000} = 0.436$

(d) $\frac{17}{50}$

$50 \times 2 = 100$

$\therefore \frac{17 \times 2}{50 \times 2} = \frac{34}{100} = 0.34$

(e) $\frac{34}{125}$

$125 \times 8 = 1000$

$\therefore \frac{34 \times 8}{125 \times 8} = \frac{272}{1000} = 0.272$

2.

(a) $0.025 = \frac{25}{1000} = \frac{\cancel{5} \times \cancel{5}}{\cancel{10}_{2} \times \cancel{5} \times 20} = \frac{1}{40}$

(b) $0.36 = \frac{36}{100} = \frac{\cancel{2} \times \cancel{2} \times 3 \times 3}{\cancel{2} \times \cancel{2} \times 5 \times 5} = \frac{9}{25}$

(c) $10.08 = \frac{1008}{100} = \frac{\cancel{2} \times \cancel{2} \times 251}{\cancel{2} \times \cancel{2} \times 25} = \frac{251}{25}$

(d) $1.15 = \frac{115}{100} = \frac{\cancel{5} \times 23}{\cancel{5} \times 20} = \frac{23}{20}$

(e) $2.30 = \frac{3\cancel{0}}{10\cancel{0}} = \frac{23}{10}$

3.

(a) 1.04 or 1.40

$1.04 = \frac{104}{100}$

$1.40 = \frac{140}{100}$

$\therefore 1.40 > 1.04$

(b) 0.6 or 0.66

$$0.6 = \frac{6}{10} = \frac{60}{100}$$

$$0.66 = \frac{66}{100}$$

$\therefore 0.66 > 0.6$

(c) 0.41 or 0.14

$$0.41 = \frac{41}{100}$$

$$0.14 = \frac{14}{100}$$

$\therefore 0.41 > 0.14$

(d) 8.56 or 8.056

$$8.56 = \frac{856}{100} = \frac{8560}{1000}$$

$$8.056 = \frac{8056}{1000}$$

$\therefore 8.56 > 8.056$

4.

(a) $32.457 = (3\times10) + (2\times1) + \left(4\times\frac{1}{10}\right) + \left(5\times\frac{1}{100}\right) + \left(7\times\frac{1}{1000}\right)$

(b) $1.006 = (1\times1) + \left(0\times\frac{1}{10}\right) + \left(0\times\frac{1}{100}\right) + \left(6\times\frac{1}{1000}\right)$

(c) $720.09 = (7\times100) + (2\times10) + (0\times1) + \left(0\times\frac{1}{10}\right) + \left(9\times\frac{1}{100}\right)$

(d) $24.162 = (2\times10) + (4\times1) + \left(1\times\frac{1}{10}\right) + \left(6\times\frac{1}{100}\right) + \left(2\times\frac{1}{1000}\right)$

(e) $951.075 = (9\times100) + (5\times10) + (1\times1) + \left(0\times\frac{1}{10}\right) + \left(7\times\frac{1}{100}\right) + \left(5\times\frac{1}{1000}\right)$

5.

(a) 12.36 + 386.9 + 2045.874

$$\begin{array}{r} {\scriptstyle 2} \\ 2045.874 \\ 386.9 \\ 12.36 \\ \hline 2445.134 \end{array}$$

(b) 564.187 + 65.79 + 902.231

$$\begin{array}{r} {\scriptstyle 1} \\ 902.231 \\ 564.187 \\ 65.79 \\ \hline 1532.208 \end{array}$$

6.

(a)

$$\begin{array}{r} 401.00 \\ -\ 205.39 \\ \hline 195.61 \end{array}$$

(b)

$$\begin{array}{r} 250.0 \\ -\ 199.7 \\ \hline 50.3 \end{array}$$

(c)

$$\begin{array}{r} 512.012 \\ -\ 421.611 \\ \hline 90.401 \end{array}$$

7.
Original weight was 55.6 + 8.5

$$\begin{array}{r} 55.6 \\ +\ \ 8.5 \\ \hline 64.1\ kg \end{array}$$

8.
Earlier height of the plant = 42.52 cm
Now height is 56.25 cm

$$\begin{array}{r} 56.25\ \text{cm} \\ -\ 42.52\ \text{cm} \\ \hline 13.73\ \text{cm} \end{array}$$

So, growth of the plant = 13.73 cm

Innings 2.6

1.

(a) $0.6 \times 3 = \frac{6}{10} \times 3 = \frac{18}{10} = 1.8$

(b) $0.28\times 5=\frac{28}{100}\times 5=\frac{140}{100}=1.4$

(c) $7.021\times 6=\frac{7021}{1000}\times 6=\frac{42126}{1000}=42.126$

(d) $42.3\times 5.1=\frac{423}{10}\times\frac{51}{10}=\frac{21573}{100}=215.73$

(e) $0.6\times 7.5=\frac{6}{10}\times\frac{75}{10}=\frac{450}{100}=4.5$

(f) $0.3\times 14.4=\frac{3}{10}\times\frac{144}{10}=\frac{432}{100}=4.32$

(g) $0.3\times 0.001\times 1.8=\frac{3}{10}\times\frac{1}{1000}\times\frac{18}{10}=\frac{54}{100000}=0.00054$

(h) $3\times 2.2\times 0.013=3\times\frac{22}{10}\times\frac{13}{1000}=\frac{858}{10000}=0.0858$

(i) $0.08\times 9\times 0.035=\frac{8}{100}\times 9\times\frac{35}{1000}=\frac{72\times 35}{100,000}=\frac{2520}{100,000}=0.02520$

(j) $21.76\times 0.003=\frac{2176}{100}\times\frac{3}{1000}=\frac{6528}{100,000}=0.06528$

(k) $11.05\times 1.05=\frac{1105}{100}\times\frac{105}{100}=\frac{116025}{10000}=11.6025$

(l) $8.08\times 0.8\times 0.08=\frac{808}{100}\times\frac{8}{10}\times\frac{8}{100}=\frac{808\times 64}{100000}=\frac{51712}{100000}=0.51712$

2.

(a) $5.16\times 2.3=5.16\times\frac{23}{10}=\frac{118.68}{10}=11.868$

(b) $0.516\times 2.3=\frac{516}{1000}\times\frac{23}{10}=\frac{5.16}{10}\times\frac{23}{10}=\frac{118.68}{100}=1.1868$

(c) $51.6\times 0.23=\frac{516}{10}\times\frac{23}{100}=\frac{5.16}{10}\times 23=\frac{118.68}{10}=11.868$

(d) $5.16\times 230=5.16\times 23\times 10=118.68\times 10=1186.8$

3.

(a) $3.99\times 10=\frac{399}{10\underline{0}}\times\underline{10}=39.9$

(b) $5.689\times 100=\frac{5689}{10\not{0}\not{0}}\times 1\not{0}\not{0}=568.9$

(c) $0.0024\times 1000=\frac{24}{10000}$ ///

$\times 10\ 0\ 0 = 2.4$

(d) $8.012\times10=\frac{8012}{1000}\times\underline{10}=80.12$

(e) $11.111\times1000=\frac{11111}{\cancel{1000}}\times\underline{1000}=11{,}111$

(f) $7.35\times1000=\frac{735}{1\cancel{0}\cancel{0}}\times10\cancel{0}\cancel{0}=7350$

(g) $0.0005\times10=\frac{5}{1000\underline{0}}\times\underline{10}=0.005$

(h) $2.14\times100=\frac{214}{\cancel{100}}\times\underline{100}=214$

4.

1 kg of apple = Rs 95.50

0.8 kg will cost

$0.8\times95.50=\frac{8}{10}\times\frac{9550}{100}=\frac{76400}{1000}$

= Rs 76.4

5.

Measure of one pencil 12.83 cm

Length of 12 pencils is

$12\times12.83=12\times\frac{1283}{100}=\frac{15396}{100}$

= 153.96 cm

6.

Speed of car = 65.83 km/h

Time = 4 h

Distance = $65.83\ \frac{\text{km}}{\text{h}}\times4\text{ h}$

$=\frac{6583}{100}\times4=\frac{26332}{100}$

= 263.32 km

Innings 2.7

1.

(a) $4.9 \div 7 = \frac{49}{10} \div 7 = \frac{\overset{7}{\cancel{49}}}{10} \times \frac{1}{\cancel{7}} = \frac{7}{10} = 0.7$

(b) $13.5 \div 5 = \frac{135}{10} \div 5 = \frac{\overset{27}{\cancel{135}}}{10} \times \frac{1}{\cancel{5}} = \frac{27}{10} = 2.7$

(c) $49.6 \div 8 = \frac{496}{10} \div 8 = \frac{496}{10} \times \frac{1}{8} = \frac{62}{10} = 6.2$

(d) $4.12 \div 4 = \frac{412}{100} \div 4 = \frac{412}{100} \times \frac{1}{4} = \frac{103}{100} = 1.03$

(e) $1.875 \div 25 = \frac{1875}{1000} \div 25 = \frac{1875}{1000} \times \frac{1}{25} = \frac{75}{1000} = 0.075$

(f) $30.48 \div 12 = \frac{3048}{100} \div 12 = \frac{3048}{100} \times \frac{1}{12} = \frac{254}{100} = 2.54$

2.

(a) $19.5 \div 10 = \frac{19.5}{10} = 1.95$

(b) $21.03 \div 10 = \frac{21.03}{10} = 2.103$

(c) $0.01 \div 10 = \frac{0.01}{10} = 0.001$

(d) $0.36 \div 1000 = \frac{0.36}{1000} = 0.00036$

(e) $125.4 \div 100 = \frac{125.4}{100} = 1.254$

(f) $2.31 \div 10 = \frac{2.31}{10} = 0.231$

(g) $35.44 \div 1000 = \frac{35.44}{1000} = 0.03544$

(h) $81.05 \div 10 = \frac{81.05}{10} = 8.105$

(i) $1 \div 100 = \frac{1}{100} = 0.01$

(j) $320 \div 1000 = \frac{320}{1000} = 0.320$

3.

(a) $0.625 \div 0.25 = \frac{\overset{25}{\cancel{625}}}{10\cancel{0}\cancel{0}} \times \frac{1\cancel{0}\cancel{0}}{\cancel{25}} = 2.5$

(b) $9.69 \div 1.9 = \frac{969}{10\,0} \times \frac{10}{19} = \frac{51}{10} = 5.1$

(c) $289.6 \div 6.4 = \frac{\cancel{2896}^{\,1448}}{\cancel{10}} \times \frac{\cancel{10}}{\cancel{64}_{\,32}^{\,\cancel{16}\,4}} = \frac{181}{4} = 45.25$

(d) $54.4 \div 3.2 = \frac{\cancel{544}^{\,\cancel{68}\,34}}{10} \times \frac{\cancel{10}}{\cancel{32}_{\,\cancel{4}\,2}} = 17$

(e) $131.58 \div 2.15 = \frac{13158}{100} \times \frac{100}{215} = 61.2$

(f) $180 \div 4.5 = 180 \times \frac{10}{45} = 4 \times 10 = 40$

(g) $387 \div 25.8 = \frac{\cancel{129}\,3}{\cancel{387}} \times \frac{\cancel{10}^{\,5}}{\cancel{258}_{\,\cancel{86}\,2}} = 15$

(h) $41.25 \div 2.5 = \frac{4125}{10\,0} \times \frac{10}{25} = \frac{165}{10} = 16.5$

(i) $4.8 \div 0.06 = \frac{48}{10} \times \frac{10\,0}{6} = 8 \times 10 = 80$

(j) $0.018 \div 0.12 = \frac{\cancel{18}^{\,3}}{10\cancel{0}\cancel{0}} \times \frac{1\cancel{0}\cancel{0}}{\cancel{12}_{\,2}} = \frac{1.5}{10} = 0.15$

4.

1.2 kg costs Rs 3.20

Cost of 1 kg $= \frac{3.20}{1.2} = \frac{\cancel{320}^{\,8} \times 1\cancel{0}}{\cancel{12}_{\,3} \times 1\cancel{0}\cancel{0}} =$ Rs 2.66

5.

Sugar used = 4.05 kg

No. of Cakes = 9

Sugar / Cake $= \frac{4.05}{9}$ kg $= \frac{405}{100 \times 9} = \frac{45}{100} = 0.45$ kg / cake

6.

1.75 kg tomato costs Rs 28.

1 kg will cost Rs $\frac{28}{1.75} = \frac{\cancel{28}^{4} \times \cancel{100}^{4}}{\cancel{175}_{7}} = \text{Rs } 16$

7.

1 cone = 125 kg

2.25 kg will fill $\frac{2.25}{.125} = \frac{\cancel{225}^{9} \times \cancel{1000}^{2}}{\cancel{125}_{25} \times 1\cancel{00}} = 18$ cones.

8.

18.5 kg is weight of one tin.

462.5 kg can be filled in

$\frac{18.5 \text{ kg}}{462.5 \text{ g}} = \frac{18.5 \times 1000}{462.5}$

$= \frac{\cancel{185} \times \cancel{1000}^{40}}{\cancel{4625}_{925}} = 40$ tins

9.

Products of two numbers 253.134.

One is 12.6

other is $\frac{253.134}{12.6} = \frac{253134}{126} \times \frac{10\cancel{0}}{100\cancel{0}} = \frac{2009}{100}$

$=20.29$

10.

(a) $2.05 \div 5 = \frac{2.05}{5} = \frac{2.05}{5} \times 10 = 4.1 \times 10 = 41$

(b) $0.205 \div 0.05 = \frac{0.205}{0.05} \times \frac{10}{10} = 4.1$

(c) $20.5 \div 5 = \frac{20.5}{5} \times \frac{10}{10} = 4.1$

(d) $205 \div 0.05 = \frac{205}{0.05} \times \frac{1}{100} \times \frac{1}{10} = \frac{4.1}{1000} = 0.0041$

Chapter Innings

1.

(i) $\frac{126}{12} \times 1.5 = 15.75$ (d)

(ii) $0.5 \times 0.05 = \frac{5}{10} \times \frac{5}{100} = \frac{25}{1000} = 0.025$ (c)

(iii) $1.1 \times 0.1 \times 0.01 = \frac{11}{10} \times \frac{1}{10} \times \frac{1}{100} = \frac{11}{10000} = 0.0011$ (b)

(iv) $15 \times 51 = 765$ then $7.65 \div 5.1 = \frac{765}{100} \times \frac{10}{51} = \frac{15}{10} = 1.5$ (c)

(v) $2\frac{3}{5} \cdot x = 1\frac{6}{7}$

$\Rightarrow \frac{13}{5} \cdot x = \frac{13}{7}$ (b)

$\Rightarrow x = \frac{13}{7} \times \frac{5}{13} = \frac{5}{7}$

(vi) $\left(\frac{3}{5} + \frac{2}{5}\right) \div \frac{4}{5} = \left(\frac{5}{5}\right) \div \frac{4}{5} = 1 \div \frac{4}{5} = \frac{5}{4} = 1\frac{1}{4}$ (b)

$32 \div 3\frac{1}{2} = 32 \div \frac{16}{5} = 32 \times \frac{5}{16} = 10$

(vii)	5	5	16		(a)

2.(*a*) $\frac{6}{7}\times\frac{5}{9}\div\frac{15}{27}$

$\frac{6}{7}\times\frac{5}{9}\times\frac{27}{15}=\frac{6}{7}$

(*b*) $2\frac{1}{2}\div1\frac{7}{8}\times\frac{7}{12}$

$\frac{5}{2}\div\frac{15}{8}\times\frac{7}{12}$

$\frac{5}{2}\times\frac{8}{15}\times\frac{7}{12}=\frac{7}{9}$

(*c*) $\frac{0.065\times0.2}{0.13\times0.01}$

$\frac{65\times2\times100\times100}{13\times1\times1000\times10}$

$\frac{10}{1}=10$

(*d*) $8\frac{8}{15}\text{ of }\frac{5}{16}\div\frac{3}{8}$

$\frac{128}{15}\text{of}\frac{5}{16}\div\frac{3}{8}$

$\frac{128}{15}\times\frac{5}{16}\times\frac{8}{3}=\frac{64}{9}=7\frac{1}{9}$

(*e*) $2.75\times0.4-0.75\times0.4$

$1.1-0.3=0.8$

(*f*) $1.4\times0.91+1.41\div0.3-0.04\div0.8$

$1.274+4.7-0.05=5.924$

3. Product of $1\frac{4}{11}$ and $2\frac{4}{9}=1\frac{4}{11}\times2\frac{4}{9}$

$\frac{15}{11}\times\frac{22}{9}=\frac{10}{3}$

Now $\frac{16}{7}\div\frac{10}{3}$

$\frac{16}{7}\times\frac{3}{10}=\frac{24}{35}$

4. Cost of 1litre (1000ml) milk = `29

Cost 750 ml = $\frac{29}{1000}\times750=$`21.75

Cost of 1litre (1000 ml) cooking oil = ` 55

Cost of 3litre 500ml (3500ml) = $\frac{55}{1000} \times 3500 = `192.5$

Total money paid for milk and cooking oil = 21.75 + 192.50 = 214.25

Amount Lorraine get back after paying ` 500 = 500 – 214.25 = ` 285.75

5. $\frac{2}{5}$ of a century = $\frac{2}{5} \times 100$

$= 40$

6. Cost of $\frac{1}{5}$ litre (or 200 ml) of oil = ` 25

Cost of 1ml of oil = $\frac{25}{200}$

Cost of $3\frac{1}{2}(\text{or } 3500 \text{ ml})$ of oil = $\frac{25}{200} \times 3500 = \frac{875}{2}$

$= `437\frac{1}{2}$

7. Let total number of pages $= x$

$\frac{3}{5}$ of book = $\frac{3}{5} \times x$

Therefore, $\frac{3}{5}x + 60 = x$

$x - \frac{3}{5}x = 60 \Rightarrow \frac{5x - 3x}{5} = 60$

$2x = 300$ or $x = 150$

Therefore total number of pages = 150

8. How many glasses of 1.25 litres can be filled with a bottle of 15 litres

Total liquid in bottle = 15 litres

Size of one glass = 1.25 litres

Number of glasses to be filled from 15 litre bottle = $\frac{15}{1.25}$

$= \frac{15}{125} \times 100 = 12$

9. Length of rope = $13\frac{3}{4}$ m or $\frac{55}{4}$ m

Length of one piece = $1\frac{3}{8}$ m or $\frac{11}{8}$ m

Number of pieces = $\frac{55}{4}\text{m} \div \frac{11}{8}\text{m}$

$= \frac{55}{4} \times \frac{8}{11} \Rightarrow 10$

10. Neclace weight = 25.5 g

Each peice weight = $\frac{25.5}{5} = 5.1\text{g}$

0.916 part of 5.1 g = $5.1 \times 0.916 = 4.6716\text{g}$

Therefore each part has 4.6716 g of gold.

Mental Maths

1. 3240	2. 3220	3. 689	4. 0	5. 0.24
6. 60	7. 100	8. 12	9. 34.8	10. 1000

Unit Innings 1

1. Representing numbers on number line,

   Two possible integral values of x if $-10 < x < -7$ will be -8 and -9

2. Add twice the predecessor of -23 to five times the successor of -11

   Predecessor of -23 = -24

   Twice of predecessor = $-24 \times 2 = -48$

   Successor of -11 = -10

   Five times of successor = $-10 \times 5 = -50$

   Required sum = $(-48) + (-50) \Rightarrow -98$

3. At 4 p.m., the temperature = 22°C

   Temperature decreased by 2°C every hour.

   Temperature at midnight (i.e. 12 at night) = 22°C - 8×2°C

   = 6°C

4. $a * b = (-a)(-b) - (-1)$

   $(5) * (-4) = (-5)(-(-4)) - (-1)$

   $= (-5)(4) - (-1)$

   $= -20 + 1 \Rightarrow -19$

5. (a) $28945 \times 99 - (-28945)$

   $28945 \times 99 + 28945$

   Using property

   $28945 \times (99 + 1) \Rightarrow 28945 \times 100$

   2894500

   (b) $173 \times (-4) - (-16) \times (-173) + 173 \times (-80)$

$173 \times (-4) - (-16) \times (-173) + 173 \times (-80)$

$[173 \times (-4)] - [(-16) \times (-173)] + [173 \times (-80)]$

$[173 \times (-4)] - [(16) \times (173)] + [173 \times (-80)]$

$173 \times [(-4) - (16) + (-80)] \Rightarrow 173 \times [-4 - 16 - 80]$

$173 \times [-100] \Rightarrow -17300$

(c) $134 \times (-105)$

$134 \times (-105)$

$134 \times (-100 - 5)$

$[134 \times (-100)] - [134 \times 5]$

$= -13400 - 670 \Rightarrow -14070$

6. (a) -7 + [12 -8 -{-18 ÷ (-3) -(4 -7 + 1)}]

Using BODMAS rule

$-7 + [12 - 8 - \{-18 \div (-3) - (4 - 7 + 1)\}]$

$-7 + [12 - 8 - \{6 + 2)\}]$

$-7 + [12 - 8 - 8] \Rightarrow -7 - 4 = -11$

(b) $18 - [25 - \{45 \div (6 + 9 \div 3)\}]$

$18 - [25 - \{45 \div (9)\}]$

$18 - [25 - \{5\}] \Rightarrow 18 - [25 - \{5\}]$

$18 - 20 = -2$

(c) -5 - (- 48) ÷ (- 6) + (- 2) × 6

-5 - 6 + (- 12) $\Rightarrow$ -23

(d) [- 15 + {4 ÷ (- 1 - 3)} × 6]

[- 15 + {4 ÷ (- 4)} × 6]

[- 15 + {- 1} × 6] $\Rightarrow -15-6$

$= -21$

(e) $|8-11| \times |12-15|$

$|-3| \times |-3| \Rightarrow 3 \times 3 = 9$

(f) $18-|-3|+|10-15|$

$18 - 3 + 5 \Rightarrow 20$

7. Shabnam spent on first day = `5

She spent on second day = `12; On third day = `19

Following the same pattern, she will spent on sixth day = `40

8. (a) $\frac{3}{5} \times 0.45 = \frac{3}{5} \times \frac{45}{100}$

$\frac{27}{100} = 0.27$

(b) 0.72×3.84

$\frac{72 \times 384}{100 \times 100} = \frac{27648}{10000}$

$= 2.7648$

9. One batch requires = $4\frac{3}{4}$ cups of flour

3 batches require = $3\times\frac{19}{4}$ cups of flour

$=14\frac{1}{4}$ cups of flour

Total flour = 22 cups

Flour left after Garima baked biscuits = $22 - \frac{57}{4}$

$=\frac{88-57}{4}=\frac{31}{4}$

Garima's sister require = $3\frac{1}{4}$ cups of flour

Flour left = $7\frac{3}{4}$ cups

Since $7\frac{3}{4} > 3\frac{1}{4}$

Therefore, there will be enough flour will left after Garima baked the biscuits.

10. Let total money = `x

First friend's share = $\frac{5}{17}x$

and, $\frac{5}{17}x = `2500 \Rightarrow x = \frac{2500\times17}{5}$

$x = 8500$

Therefore total money = `8500

and other friend's share = `8500 - `2500 = `6000

11. (a) $\left(\frac{4}{5}-\frac{2}{3}\right)\times1\frac{1}{2}$

$\left(\frac{12-10}{15}\right)\times\frac{3}{2} \Rightarrow \frac{2}{15}\times\frac{3}{2}$

$=\frac{1}{5}$

(b) $\left(2-\frac{1}{3}+\frac{1}{5}\right)\times\frac{5}{28}\times\frac{1}{2}$

$\left(\frac{30-5+3}{15}\right)\times\frac{5}{28}\times\frac{1}{2} \Rightarrow \frac{28}{15}\times\frac{5}{28}\times\frac{1}{2}$

$=\frac{1}{6}$

Net Practice—Unit 2

1.(*a*)

$7\frac{1}{3} \div \frac{2}{3} of\ 2\frac{1}{5}$

$\frac{22}{3} \div \frac{2}{3} \times \frac{11}{5} \Rightarrow \frac{\cancel{22}}{\cancel{3}} \times \frac{\cancel{15}}{\cancel{22}} = 5$

(*b*) $\frac{2}{9} + \frac{1}{3} - \frac{1}{6}$

$\frac{4+6-3}{18} \Rightarrow \frac{7}{18}$

(*c*) $20\frac{4}{5} + 16\frac{1}{2} - 4\frac{1}{3} \Rightarrow \frac{104}{5} + \frac{33}{2} - \frac{13}{3}$

$\frac{624+495-130}{30} \Rightarrow \frac{989}{30}$

$32\frac{29}{30}$

2.(*a*)

$\frac{\cancel{105}}{\cancel{25}} = 5$

(*b*)

$\frac{270/}{900/} \Rightarrow \frac{\cancel{27}}{\cancel{90}} = \frac{3}{10}$

(*c*)

$\frac{\cancel{84}}{\cancel{105}} = \frac{4}{5}$

(*d*)

$\frac{\cancel{1365}}{\cancel{1560}} = \frac{273}{312} or \frac{7}{8}$

3.(*a*)

$\frac{3}{7} = \frac{27}{x}$

$or\ x = \frac{27 \times 7}{3}$

$or\ x = 63$

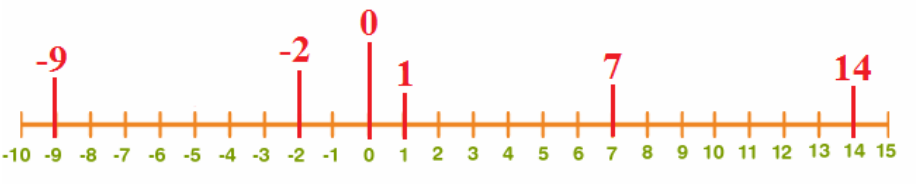
(*b*)

$$\frac{11}{x}=\frac{220}{260}$$

$$or\ x=\frac{11\times 260}{220}$$

$$or\ x=13$$

4.



5. (a) Reciprocal of $\frac{1}{5}=5$

(*b*) Reciprocal of $\frac{7}{2}=\frac{2}{7}$

(*c*) Reciprocal of $-5=-\frac{1}{5}$

(d) Reciprocal of $-9=-\frac{1}{9}$

(e) Reciprocal of $\left(\frac{1}{2}+\frac{2}{3}\right)\Rightarrow\frac{7}{6}=\frac{6}{7}$

6. Taking the LCM for the following to obtain the prime factors.

(*a*) $64=2\times 2\times 2\times 2\times 2\times 2$

(*b*) $-36=-(2\times 2\times 3\times 3)$

(*c*) $100=2\times 2\times 5\times 5$

7. (- 1) × (- 1) × (- 1) × (- 1) × (- 1)

Since number of minus signs are odd, therefore answer will be -1.

(*b*) $\frac{1}{3}\times\frac{1}{3}\times\frac{1}{3}\times\frac{1}{3}$

$$\frac{1}{3\times 3\times 3\times 3}\Rightarrow\frac{1}{81}$$

8.

+	$\frac{3}{2}$	$\frac{4}{5}$	$\frac{1}{3}$
$\frac{1}{2}$	$\frac{1}{2}+\frac{3}{2}=2$	$\frac{1}{2}+\frac{4}{5}=\frac{13}{10}$	$\frac{1}{2}+\frac{1}{3}=\frac{5}{6}$
$\frac{6}{7}$	$\frac{6}{7}+\frac{3}{2}=\frac{33}{14}$	$\frac{6}{7}+\frac{4}{5}=\frac{58}{35}$	$\frac{6}{7}+\frac{1}{3}=\frac{25}{21}$
$\frac{2}{5}$	$\frac{2}{5}+\frac{3}{2}=\frac{19}{10}$	$\frac{2}{5}+\frac{4}{5}=\frac{6}{5}$	$\frac{2}{5}+\frac{1}{3}=\frac{11}{15}$

9.(*a*) $\frac{2}{11}+\frac{2}{11}=\frac{4}{11}$

$\frac{2}{11}+\frac{3}{11}=\frac{5}{11}$

(*b*) $\frac{5}{8}+\frac{3}{8}+\frac{4}{8}=\frac{12}{8}=1\frac{1}{2}$

$\frac{5}{8}+\frac{6}{8}+\frac{1}{8}=\frac{12}{8}=1\frac{1}{2}$

$\frac{4}{8}+\frac{7}{8}+\frac{1}{8}=\frac{12}{8}=1\frac{1}{2}$

Ch3: Rational Numbers
Innings 3.1

1.

(a) $\frac{-7}{9}\times\frac{2}{2}=\frac{-14}{18}$

$\frac{-7}{9}\times\frac{3}{3}=\frac{-21}{27}$

$\frac{-7}{9}\times\frac{4}{4}=\frac{-28}{36}$

(b)

$\frac{-13}{4}\times\frac{2}{2}=\frac{-26}{8}$

$\frac{-13}{4}\times\frac{3}{3}=\frac{-39}{12}$

$\frac{-13}{4}\times\frac{4}{4}=\frac{-52}{16}$

(c)

$\frac{5}{3}\times\frac{2}{2}=\frac{10}{6}$

$\frac{5}{3}\times\frac{3}{3}=\frac{15}{9}$

$\frac{5}{3}\times\frac{4}{4}=\frac{20}{12}$

(d)

$\frac{-2}{5}\times\frac{2}{2}=\frac{-4}{10}$

$\frac{-2}{5}\times\frac{3}{3}=\frac{-6}{15}$

$\frac{-2}{5}\times\frac{4}{4}=\frac{-8}{20}$

(e)

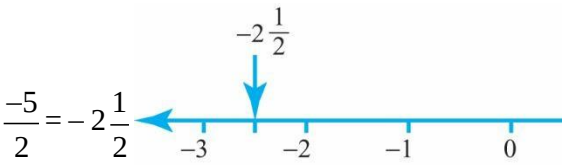
$\frac{-3}{4}\times\frac{2}{2}=\frac{-6}{8}$

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

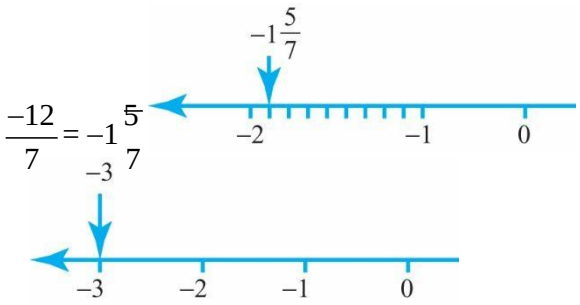
$\frac{-3}{4}\times\frac{4}{4}=\frac{-12}{16}$

2.

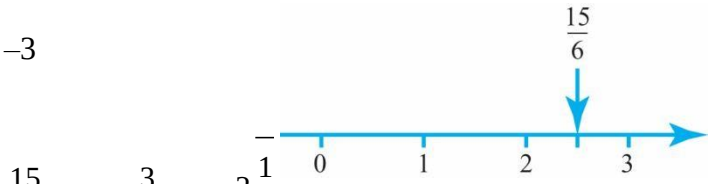
(a) $\frac{-5}{2}=-2\frac{1}{2}$



(b) $\frac{-12}{7}=-1\frac{5}{7}$

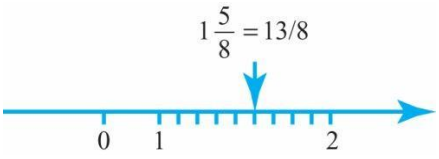


(c) $-3\frac{1}{2}=\frac{15}{6}$



(d) $\frac{15}{6}=2\frac{3}{6}=2\frac{1}{2}$

(e) $\frac{13}{8} = 1\frac{5}{8}$



3.

(a) $\frac{5}{(-7)} \times \frac{-1}{-1} = \frac{-5}{7}$

(b) $\frac{-6}{-18} \times \frac{-1}{-1} = \frac{6}{18}$

(c) $\frac{2}{-11} \times \frac{-1}{-1} = \frac{-2}{11}$

(d) $\frac{-7}{-22} \times \frac{-1}{-1} = \frac{7}{22}$

(e) $\frac{-34}{-61} \times \frac{-1}{-1} = \frac{34}{61}$

4.

(a) $-\frac{19}{76} = \frac{-19}{19 \times 4} = \frac{-1}{4}$

(b) $-\frac{225}{625} = -\frac{\cancel{5} \times \cancel{5} \times 9}{5 \times \cancel{5} \times 5 \times 5} = \frac{-9}{25}$

(c) $-\frac{288}{384} = -\frac{\cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{3} \times 3}{\cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{2} \times 2 \times 2 \times \cancel{3}} = -\frac{3}{4}$

(d) $-\frac{357}{391} = -\frac{3 \times 7 \times \cancel{17}}{\cancel{17} \times 23} = -\frac{21}{23}$

(e) $\frac{-259}{-407} = \frac{-7 \times \cancel{37}}{\cancel{-37} \times 11} = \frac{7}{11}$

5.

We first find the LCM of the denominators, and then we convert all denominators into the LCM.

2 | 2 −12 − 6 −18

3 | 1 − 6 − 3 − 9

$$1-2-1-3$$

$$=36$$

$$\frac{-1}{2}\times\frac{18}{18}=-\frac{18}{36}$$

$\frac{5}{12}\times\frac{3}{3}=\frac{15}{36}$

$\frac{5}{6}\times\frac{6}{6}=\frac{30}{36}$

$\frac{11}{18}\times\frac{2}{2}=\frac{22}{36}$

$\therefore \frac{5}{6}\rangle\frac{11}{8}\rangle\frac{5}{12}\rangle-\frac{1}{2}$

6. First arrange all the denominators as the LCM.

$5\overline{)5,10,10,15}$

$1-2-2-3$

$=60$

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

$\frac{-7}{10}\times\frac{6}{6}=\frac{-42}{60};$

$\frac{8}{-10}=-\frac{8}{10}\times\frac{6}{6}=-\frac{48}{60};$

$\frac{-17}{15}\times\frac{4}{4}=\frac{-68}{60}$

$\therefore -\frac{17}{15}\langle\frac{8}{-10}\langle\frac{-7}{10}\langle\frac{3}{-5}$

7.

(a)

$\frac{-5}{6}\text{ or }\frac{-4}{3}$

$\Rightarrow -5\times 3,\text{ or }-4\times 6$

$\Rightarrow -15\text{ or }-24$

$\therefore \frac{-5}{6}\ \rangle\ \frac{-4}{3}$

(b)

$\frac{9}{14}\text{or}\ \frac{16}{21}\Rightarrow 9\times 21\ \text{or}16\times 14\Rightarrow 189\text{or }224$

$\therefore \frac{16}{21}\ \rangle\ \frac{9}{14}$

$\frac{-1}{\ }\text{or}\ \frac{-2}{\ }\Rightarrow -1\times 7\text{ or}-2\times 8\Rightarrow -7\text{ or }-16$

(c) $8\qquad 7$

$\therefore \frac{-1}{8}\ \rangle\ \frac{-2}{7}$

$\frac{-6}{11}$ or $\frac{-11}{20} \Rightarrow -6 \times 20$ or $-11 \times 11 \Rightarrow -120$ or -121

(d)

$\therefore \frac{-16}{11} \rangle \frac{-11}{20}$

8.

Shweta lives $\frac{3}{4}$ km from her school.

Annie lives $\frac{2}{3}$ km from her school.

$\therefore \frac{3}{4}$ or $\frac{2}{3} \Rightarrow 9$ or 8

$\therefore$ Shweta $\left(\frac{3}{4}\text{ km}\right)$ lives farther than Annie $\left(\frac{2}{3}\right)$.

9.

$\frac{-4}{5}$ and $\frac{-2}{3}$.

Take the LCM = 15

$\therefore \frac{-4}{5} \times \frac{3}{3} = \frac{-12}{15}$

$\frac{-2}{3} \times \frac{5}{5} = \frac{-10}{15}$

Equivalent numbers are $\frac{-12}{15} \times \frac{3}{3} = \frac{-36}{45}$ and $\frac{-10}{15} \times \frac{3}{3} = \frac{-30}{45}$

$\therefore$ The three numbers are $-\frac{31}{45}, -\frac{32}{45}, -\frac{33}{45}$

Innings 3.2

1.

(a) $-\frac{3}{8}+\frac{18}{20} = \frac{-3\times5+18\times2}{40} = \frac{-15+36}{40} = \frac{21}{40}$

$4\overline{)8-20}$

$2-5$

$=40$

(b) $-\frac{7}{8}+\frac{5}{6} = \frac{-7\times3+5\times4}{24} = \frac{-21+20}{24} = -\frac{1}{24}$

$2\overline{)8-6}$

$4-3$

$=24$

(c) $-3+\frac{1}{4} = \frac{-3\times4+1}{4} = \frac{-12+1}{4} = -\frac{11}{4}$

(d) $\frac{7}{3}+\frac{-5}{18}+\frac{7}{-12} = \frac{7}{3}-\frac{5}{18}-\frac{7}{12}$

$3\overline{)3-18-12}$

$2\overline{)1-6-4}$

$1-3-2$

$=36$

$\Rightarrow \frac{7\times12-5\times2-7\times3}{36} = \frac{84-10-21}{36} = \frac{84-31}{36} = \frac{54}{36} = \frac{3}{4} = 1\frac{1}{2}$

2.

(a)

$\frac{7}{8}-\frac{3}{4}$

$4\overline{)8-4}$

$2-1$

$=8$

$\Rightarrow \frac{7-3\times2}{8} = \frac{7-6}{8} = \frac{1}{8}$

(b) $\frac{-4}{11}-(-6) = \frac{-4}{11}+6 = \frac{-4+6\times11}{11} = \frac{-4+66}{11} = \frac{62}{11} = 5\frac{7}{11}$

(c) $\frac{-7}{5}-\frac{(-8)}{15} = \frac{-7}{5}+\frac{8}{15} = \frac{-7\times3+8\times1}{15} = \frac{-21+8}{15} = \frac{-13}{15}$

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

3.

(a) $\frac{4}{10}\times\frac{-5}{12}\times\frac{2}{5}=\frac{\cancel{2}\times\cancel{2}}{\cancel{2}\times\cancel{5}}\times\frac{\cancel{-5}}{\cancel{2}\times\cancel{2}\times 3}\times\frac{\cancel{2}}{\cancel{5}}$

$=\frac{-1}{15}$

(b) $\frac{16}{5}\times\frac{5}{11}\times\frac{7}{6}=\frac{\cancel{2}\times 8}{\cancel{6}}\times\frac{\cancel{5}}{11}\times\frac{7}{\cancel{2}\times 3}=\frac{56}{33}$

(c) $\frac{15}{28}\times\frac{-119}{9}=\frac{\cancel{3}\times 5}{2\times 14}\times\frac{-119}{\cancel{9}\,3}=\frac{-595}{84}$

(d) $\frac{\cancel{3}}{8}\times\frac{-5}{7}\times\frac{\cancel{7}}{\cancel{9}3}=\frac{-5}{24}$

(e) $\frac{8}{35}\times\frac{21}{-32}=\frac{\cancel{8}}{5\times\cancel{7}}\times\frac{3\times\cancel{7}}{-4\times\cancel{8}}=\frac{-3}{20}$

4.

(a) $\frac{-15}{9}\div\frac{30}{38}=\frac{\cancel{-15}}{9}\times\frac{\overset{19}{\cancel{38}}}{\underset{\cancel{2}}{\cancel{30}}}=\frac{-19}{9}$

(b) $\frac{31}{17}\div\frac{33}{\lfloor -34\rfloor}\lceil\frac{-104}{\ }\rceil=\frac{31}{17}\div\frac{104}{33}=\frac{31}{\cancel{17}}\times\frac{\overset{2}{\cancel{34}}}{\cancel{104}}=\frac{31}{52}$

(c) $\frac{-48}{49}\div\frac{72}{-35}=\frac{\overset{2}{\cancel{-48}}}{\underset{7}{49}}\times\frac{\overset{5}{\cancel{-35}}}{\underset{3}{\cancel{72}}}=\frac{10}{21}$

(d) $2\div\frac{3}{5}=2\times\frac{5}{3}=\frac{10}{3}$

5.

$\left(\frac{\overset{12}{\cancel{24}}}{\underset{2}{\cancel{4}}}\times\frac{\cancel{2}}{\ }\right)\Big|_{-}\left(\frac{1}{\cancel{5}}\times\frac{\overset{2}{\cancel{-10}}}{\ }\right)$

(a) $\left|\left(5\right)\right|\left|\left(3\right)\right|$

$$= \frac{12}{5} - \left(\frac{-2}{3}\right) = \frac{12}{5} + \frac{2}{3} = \frac{12\times 3 + 2\times 5}{15} = \frac{36+10}{15} = \frac{46}{15}$$

(b) $\left(\frac{-3}{8} \times \frac{11}{6^{2}}\right) - \left(\frac{2}{3} - \frac{3}{4}\right) \div \frac{-101}{48}$

$= \frac{-11}{16} - \left(\frac{8-9}{12}\right) \div \frac{-101}{-48}$

$= \frac{-11}{16} - \left(\frac{-1}{12}\right) \div \frac{-101}{48}$

$= \frac{-11}{16} - \left(\frac{-1}{12} \times \frac{-101}{48}\right)$

$= \frac{-11}{16} - \frac{101}{12\times 48} = \frac{-11}{16} - \frac{101}{576}$

$= \frac{-396 - 101}{576} = \frac{-497}{576}$

(c) $\left(\frac{5}{9} \times \frac{-4}{7} \div \frac{-8}{27}\right) \times \left(\frac{3}{-4}\right)$

$= \frac{5}{9} \times \frac{-4}{7} \times \frac{-27^{3}}{8} \times \frac{3}{4}$

$= \frac{45}{56}$

(d) $\left(\frac{-5}{-8} \times \frac{-3}{7} \times \frac{4}{-15}\right) + \left(\frac{4}{7} \times \frac{-21^{-3}}{8_{2}}\right)$

$= \left(\frac{1}{14}\right) + \left(\frac{-3}{2}\right)$

$= \frac{1-21}{14} = \frac{-20}{14} = \frac{-10}{7}$

6.

Sum of $\frac{-5}{4}$ and $\frac{11}{3} = \frac{-15+44}{12} = \frac{29}{12}$

Product of $\frac{3}{2}$ and $\frac{11}{6} = \frac{3}{2} \times \frac{11}{\cancel{6}_{2}} = \frac{11}{4}$

$\frac{29}{12} \div \frac{11}{4} = \frac{29}{\cancel{12}_{3}} \times \frac{\cancel{4}}{11} = \frac{29}{33}$

7.

Let one number be *a*.

Then $\frac{-9}{7} \times a = \frac{-18}{35}$

$\therefore a = \frac{\cancel{-18}^{2}}{\cancel{35}_{5}} \times \frac{\cancel{-7}}{\cancel{9}} = \frac{2}{5}$

8.

$\frac{-14}{15} + \frac{7}{10} = \frac{-8+21}{30} = \frac{13}{30.}$

Let the number to be added $\pm x$

$\therefore \frac{13}{30} + x = 1$

$x = 1 - \frac{13}{30} = \frac{30-13}{30} = \frac{17}{30}$

9.

Let one rational number be '*x*'.

Then $x + \frac{6}{13} = \frac{-4}{7}$

$\therefore x = -\frac{4}{7} - \frac{6}{13} = \frac{-52-42}{91} = \frac{-94}{91}$

10.

Multiplicative inverse of $3\frac{1}{2} = \frac{7}{2}$ is $\frac{2}{7}$

Additive Inverse of $2\frac{5}{8} = \frac{21}{8}$ is $\frac{-21}{8}$

$\frac{2}{7} \times \frac{-21}{8} = \frac{\cancel{2}}{\cancel{7}} \times \frac{-3 \times \cancel{7}}{\cancel{2} \times 4} = \frac{-3}{4}$

Chapter Innings

1.

(i) (a)

(ii) (b)

(iii) $\frac{-7}{3} \div \frac{35}{12} = \frac{\cancel{-7}}{\cancel{3}} \times \frac{\overset{4}{\cancel{12}}}{\underset{5}{\cancel{35}}} = \frac{-4}{5}$

(b)

(iv) (d)

(v) $\frac{-2}{9} - 4 = \frac{-2-36}{9} = \frac{-38}{9}$

(c)

2.

(a) $\frac{-18}{} \times \frac{-1}{} = \frac{18}{} = \frac{3}{}$

(b) $\frac{-24}{42} \times \frac{-1}{-30} = \frac{-1}{-1} = \frac{24}{-42} = \frac{4}{-7} = \frac{-7}{5}$

(c) $\frac{420}{-28} \times \frac{-1}{-1} = \frac{-420}{28} = \frac{-15}{1}$

(d) $\frac{567}{21} = \frac{81}{3} = \frac{27}{1}$

(e) $\frac{-279}{-30} = \frac{279}{30} = \frac{93}{10}$

3.

(a) $\frac{-7}{12} \times \frac{2}{2} = \frac{-14}{24}$; $\frac{-7}{12} \times \frac{3}{3} = \frac{-21}{36}$; $\frac{-7}{12} \times \frac{4}{4} = \frac{-28}{48}$

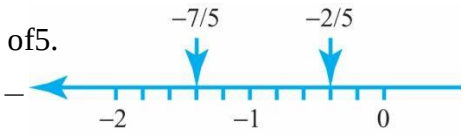
(b) $\frac{-3}{7} \times \frac{2}{2} = \frac{-6}{14}$; $\frac{-3}{7} \times \frac{3}{3} = \frac{-9}{21}$; $\frac{-3}{7} \times \frac{4}{4} = \frac{-12}{28}$

(c) $\frac{2}{3} \times \frac{2}{2} = \frac{4}{6}$; $\frac{2}{3} \times \frac{3}{3} = \frac{6}{9}$; $\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$

(d) $\frac{-1}{4} \times \frac{2}{2} = \frac{-2}{8}$; $\frac{-1}{4} \times \frac{3}{3} = \frac{-3}{12}$; $\frac{-1}{4} \times \frac{4}{4} = \frac{-4}{16}$

(e) $\frac{15}{-33} \times \frac{2}{2} = \frac{30}{-66}$; $\frac{15}{-33} \times \frac{3}{3} = \frac{15}{-99}$; $\frac{15}{-33} \times \frac{4}{4} = \frac{60}{-132}$

4. — Successor of 5.



$$-\frac{2}{5} - \frac{1}{5} = -\frac{7}{5} = -1\frac{2}{5}$$

(a) 2 and −3

$$\frac{-2+-3}{2}=\frac{-5}{2}$$

$$\left(-2-\frac{5}{2}\right)\times\frac{1}{2}=\frac{-9}{4}$$

$$\left(-3-\frac{5}{2}\right)\frac{1}{2}=\frac{-11}{4}$$

(b) $\frac{-1}{9}$ and $\frac{1}{3}$ $\Rightarrow \frac{-1}{9}\times\frac{1}{1}=\frac{-1}{9}$

$$\frac{1}{3}\times\frac{3}{3}=\frac{3}{9}$$

$$\frac{-1}{9}\times\frac{2}{2}=\frac{-2}{18}$$

$$\frac{3}{9}\times\frac{2}{2}=\frac{6}{18}$$

$$\therefore \frac{-3}{18},\frac{1}{18},\frac{3}{18}---$$

(c) −4 and −3

$$\frac{-4-3}{2}=\frac{-7}{2}$$

$$\left(-4-\frac{7}{2}\right)\frac{1}{2}=\frac{-15}{4}$$

$$\left(-3-\frac{7}{2}\right)\frac{1}{2}=\frac{-13}{4}$$

(d) $\frac{-1}{7}$ and $\frac{-1}{8}$

$$\frac{-1}{7}\times\frac{8}{8}=\frac{-8}{56}$$

$$\frac{-1}{8}\times\frac{7}{7}=\frac{-7}{56}$$

$$\frac{-8}{56}\times\frac{2}{2}=\frac{-16}{112}$$

$$\frac{-7}{56}\times\frac{2}{2}=\frac{-14}{112}$$

$$\frac{-16}{112},\frac{-15}{112},\frac{-14}{112}$$

6.

Reciprocal of $\frac{15}{18}$ is $\frac{18}{15}$

Additive inverse of $\frac{-16}{36}$ is $\frac{16}{36}$

$\frac{18}{15}$, $\frac{16}{36}$ $\quad 18\times 36;\ 16\times 15$

$\quad 648;\ 240$

$\therefore \frac{18}{15} > \frac{16}{36}$

7.

Sum of $\frac{-12}{5}$ and $\frac{4}{5}$

$$\frac{-12}{5}+\frac{4}{5}=\frac{-12+4}{5}=\frac{-8}{5}$$

Difference of $\frac{73}{15}$ and $\frac{21}{5}$

$$\frac{73}{15}-\frac{21}{5}=\frac{73}{15}-\frac{63}{15}=\frac{10}{15}$$

Reciprocal of $\frac{10}{15}$ is $\frac{15}{10}$

$$\therefore \frac{-8}{5}\div\frac{15}{10}=\frac{-8}{\cancel{5}}\times\frac{\cancel{10}^{2}}{15}=\frac{-16}{15}$$

8.

Let the number to be added be x.

$$\frac{1}{2}+\frac{1}{3}+\frac{1}{5}=\frac{15+10+6}{30}=\frac{31}{30}$$

$\frac{31}{30} + x = 8$

$x = 8 - \frac{31}{30} = \frac{240-31}{30} = \frac{209}{30} = 6\frac{29}{30}$

9.

Product of $2\frac{1}{3}$ and $1\frac{3}{14} = \frac{7}{3} \times \frac{17}{14} = \frac{17}{6}$

Sum of $\frac{-2}{5}$ and $3\frac{4}{5} = \frac{-2}{5} + \frac{19}{5} = \frac{17}{5}$

$\frac{17}{6} \div \frac{17}{5} = \frac{17}{6} \times \frac{5}{17} = \frac{5}{6}$

10.

(a) $\left(\frac{1}{5} - \frac{1}{6}\right) \div \left(\frac{1}{6} - \frac{1}{15}\right)$

$= \left(\frac{6-5}{30}\right) \div \left(\frac{15-6}{90}\right) = \frac{1}{30} \div \frac{9}{90} = \frac{1}{\cancel{30}_{1}} \times \frac{\cancel{90}^{3}}{\cancel{9}_{1}} = \frac{1}{3}$

(b) $\frac{-1}{3} \times 0 - \left(1\frac{2}{3}\right) \div \left(\frac{-1}{3}\right)$

$= 0 - \left(5 \times \frac{-3}{1}\right) = 0 - (-5) = 5$

(c) $\frac{1}{-6} + \frac{5}{12} - \frac{2}{9} + \frac{-4}{15}$

$= \frac{-1}{6} + \frac{5}{12} - \frac{2}{9} - \frac{4}{15}$

$= \frac{-30 + 75 - 40 - 48}{180} = \frac{-118 + 75}{180} = \frac{-43}{180}$

$3 \mid 6 - 12 - 9 - 15$

$2 \mid 2 - 4 - 3 - 5 \quad = 180$

$1 - 2 - 3 - 5$

(d) $\frac{-7}{42} + \frac{-7}{21} + \frac{7}{84} + \frac{5}{6} = \frac{-1}{6} - \frac{1}{3} + \frac{1}{12} + \frac{5}{6}$

$3 \mid 6 - 3 - 12 - 6$

$2 \mid 2 - 1 - 4 - 2$

$1 - 1 - 2 - 1$

$= \frac{-2 - 4 + 1 + 10}{12} = \frac{-6 + 11}{12} = \frac{5}{12}$

(e) $\left(\frac{4}{7} \div \frac{16}{21}\right) \div \frac{5}{-8} = \frac{\cancel{4}}{\cancel{7}} \times \frac{\cancel{21}^{3}}{\cancel{16}_{4}} \times \frac{-8^{4}}{5} = \frac{-12}{5}$

(f) $\left(\frac{8}{5} - \frac{11}{15}\right) \div \left(\frac{9}{12} - \frac{3}{20}\right) = \left(\frac{24-11}{15}\right) \div \left(\frac{45-9}{60}\right)$

$= \frac{13}{\cancel{15}} \times \frac{\cancel{60}^{4}}{\cancel{36}_{9}} = \frac{13}{9}$

Mental Maths

1.

$\frac{1}{5} - \frac{1}{6} = \frac{6-5}{30} = \frac{1}{30}$

Reciprocal of $\frac{1}{30} = 30$

2.

$\left(\frac{1}{2} \times \frac{5}{3}\right) \div \frac{1}{12} = \frac{5}{6} \times \frac{12}{1} = 10$

Additive inverse of $10 = -10$

3. There are innumerable rational numbers between 1 and 2.

4.

$p > q$

$\Rightarrow \frac{p}{q} > 1$

5.

Multiplicative inverse of $-7 = \frac{-1}{7}$

$$\frac{-1}{7} \times \frac{-1}{14} = \frac{1}{98}$$