

HINTS AND SOLUTIONS

PART-1

CHAPTER 1 : LARGE NUMBERS AROUND US

Let's Recall

- (a) Greatest number: 813, smallest number: 109
(b) Greatest number: 89423, smallest number: 100
(c) Greatest number: 67321, smallest number: 18
(d) Greatest number: 12307, smallest number: 249
- Since $87 < 98 < 112 < 125 < 142 < 152$, the children in their ascending order are Dolly, Pinki, Sonu, Anny, Soham, Raman
- Since $21,500 < 27,999 < 29,490 < 34,099$, we have The almirah C is the costliest, and almirah B is the cheapest.

Think Tank (Page 10)

We want the greatest 4-digit number whose digits decrease from left to right. Also, each middle digit must be smaller than half of the sum of its two neighbouring digits. To make the number as large as possible, choose the biggest digits from left to right while checking the condition.

The first digit can be at most 9. Now, try the next-largest digits in decreasing order.

- If we try 9, 8, 7, 6, then the second digit 8 is not smaller than half of 9 and 7 (which is 8). So this does not work.
- Next, try smaller digits. Consider 9, 7, 5, 4 (half of 14 is 7, so we must take a digit smaller than 7). The digit 6 is smaller than half of 9 and 5.
- The digit 5 is equal to half of 6 and 4, but digit 4 is less than half of 6 and 3, so this works.

All digits decrease strictly and satisfy the rule.

Thus, the greatest possible number is 9643.

Think Tank (Page 12)

Since the digits count how many times each digit appears, the sum of all digits must be 10, and applying this rule systematically for each digit gives the unique number 6210001000.

Practice time 1A

- We know that: Hundred thousand = 1 lakh,
1 million = 10 lakhs, 10 million = 1 crore,
Hundred Million = 10 crore. Using these equivalents, we can get the correct match as:
(a) \rightarrow (iv), (b) \rightarrow (i), (c) \rightarrow (ii), (d) \rightarrow (iii)
- We know that commas show the place value periods. So, we read each number name according to the system in which its commas are placed. Thus, the correct number names of the given numerals are as follows:
(a) 2,35,87,954 (*Indian system*)
Two crore thirty-five lakh eighty-seven thousand nine hundred fifty-four
(b) 4,00,05,47,238 (*Indian system*)
Four arab five lakh forty-seven thousand two hundred thirty-eight
(c) 567,802,956 (*International system*)
Five hundred sixty-seven million eight hundred two thousand nine hundred fifty-six
(d) 6,802,774,114 (*International system*)
Six billion eight hundred two million seven hundred seventy-four thousand one hundred fourteen
- We write each number in expanded form by expressing it as the sum of the values of its digits according to their place values.
(a) $3456 = 3000 + 400 + 50 + 6$
(b) $7896 = 7000 + 800 + 90 + 6$
(c) $92,876 = 90,000 + 2,000 + 800 + 70 + 6$
(d) $234,902 = 2,00,000 + 30,000 + 4,000 + 900 + 2$
(e) $2,08,76,005 = 2,00,00,000 + 8,00,000 + 70,000 + 6,000 + 5$
(f) $876,258,743 = 800,000,000 + 70,000,000 + 6,000,000 + 200,000 + 50,000 + 8,000 + 700 + 40 + 3$
- We rewrite the numbers by placing commas according to the rules of each system. In the Indian system, the first comma is placed after three digits from the right and then after every two digits. In the International (American) system, commas are placed after every three digits from the right.



After placing commas, we read the number names according to the place values in that system.

- (a) Indian: 5,64,789 — Five lakh sixty-four thousand seven hundred eighty-nine
 International: 564,789 — Five hundred sixty-four thousand seven hundred eighty-nine
- (b) Indian: 38,09,234 — Thirty-eight lakh nine thousand two hundred thirty-four
 International: 3,809,234 — Three million eight hundred nine thousand two hundred thirty-four
- (c) Indian: 4,44,92,012 — Four crore forty-four lakh ninety-two thousand twelve
 International: 44,492,012 — Forty-four million four hundred ninety-two thousand twelve
- (d) Indian: 52,24,58,923 — Fifty-two crore twenty-four lakh fifty-eight thousand nine hundred twenty-three
 International: 522,458,923 — Five hundred twenty-two million four hundred fifty-eight thousand nine hundred twenty-three

5. (a) To form the greatest number, we arrange the digits in descending order, while to form the smallest number, we arrange the digits in ascending order.
 Therefore, Greatest Number = 9876;
 Smallest Number = 6789
- (b) To form the greatest number, we arrange the digits in descending order.
 To form the smallest number, we place the smallest non-zero digit first, then 0, then the remaining digits in ascending order. Therefore,
 Greatest Number = 8530;
 Smallest Number = 3058
- (c), (d): Same as part (a)
6. The digit in the thousands place is 7.
 The hundreds digit is 3 less than 7, so it is 4.
 The tens digit is 0.
 The ones digit is $40 \div 8 = 5$.
 The ten-thousands digit is the sum of the hundreds and ones digits, so it is $4 + 5 = 9$.
 Therefore, the five-digit number is 97,405.

| 7. S. No. | Number Name | Billions | Millions | | | Thousands | | | Ones | | | Numeral |
|-----------|---|----------|----------|----|---|-----------|-----|----|------|---|---|---------------|
| | | | HM | TM | M | HTh | TTh | Th | H | T | O | |
| (a) | Six hundred two million six thousand six hundred two | — | 6 | 0 | 2 | 0 | 0 | 6 | 6 | 0 | 2 | 602,006,602 |
| (b) | Eighty-three million | — | 0 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 83,000,000 |
| (c) | Four hundred million four hundred thousand four hundred | — | 4 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 400,400,400 |
| (d) | Nine hundred ninety-nine million nine hundred nine thousand ninety-nine | — | 9 | 9 | 9 | 9 | 0 | 9 | 0 | 9 | 9 | 999,909,099 |
| (e) | Two billion three hundred sixty-five thousand seventy-three | 2 | 0 | 0 | 0 | 3 | 6 | 5 | 0 | 7 | 3 | 2,000,365,073 |

Practice Time 1B

1. (a) Total wheat varieties = 40,086. If we eat 2 varieties every day, the number of days required to finish all varieties is:

$$\text{Days} = 40,086 \div 2 = 20,043 \text{ days}$$

$$\text{Years} = 20,043 \div 365 \approx 54.9 \text{ years}$$

- (b) Total maize varieties = 9,479. If we eat 1 variety per day, the number of days required is:

$$\text{Days} = 9,479 \text{ days}$$

$$\text{Years} = 9,479 \div 365 \approx 26 \text{ years}$$

- (c) In 28 years, the total days = $28 \times 365 = 10,220$.
Eating 2 varieties per day, we can cover:

$$\text{Varieties} = 10,220 \times 2 = 20,440$$

The crops with varieties $\leq 20,440$ are: Maize (9,479), Pearl millet (8,395), Others (17,614), Sorghum (20,432).

2. Distance = 3,556 km. If traveling 10 km per day, the number of days required is:

$$\text{Days} = 3,556 \div 10 \approx 356 \text{ days}$$

Starting on 1st January 2025, 356 days later falls on 22nd December 2025.

3. Height of Statue of Unity = 182 m = 182,000 mm
Height per coin (diameter) = 31 mm coins

$$\text{Number of coins} = 182,000 \div 31 \approx 5,871 \text{ coins}$$

4. (a) 8 times (+1000) + 3 times (+100)
(b) 5 times (+1000) + 4 times (+100) + 7 times (+10)
(c) 5 times (+10000) + 5 times (+1000) + 5 times (+100) + 5 times (+10) + 5 times (+1)
(d) 3 times (+100000) + 6 times (+10000) + 7 times (+1000) + 8 times (+100) + 13 times (+1)
(e) 36 times (+1000)
(f) 1 time (+1000000) + 8 times (+10)

5. Eagle flying height = 5,000 m

Palm tree height = 10 m

Number of trees stacked = $5,000 \div 10 = 500$ trees

6. Grey-Headed Albatross Migration

Distance across Pacific Ocean = 15,500 km

Daily distance covered = 900 km

$$\text{Days required} = 15,500 \div 900$$

$$\approx 17.2 \approx 17 \text{ days}$$

7. (a) 960 by pressing 9 (100) + 6 (10)
(b) Yes; 9 times (+100) + 8 times (+10) + 17 times (+1) (Answer may vary)

8. (a) 5 times (+1000) + 7 times (+10) + 2 times (+1) = 14 button presses

- (b) 4 times (+1000) + 10 times (+100) + 6 times (+10) + 12 times (+1) = 32 button presses (Answer may vary)

9. Mount Everest in Floors

Height of Mount Everest = 8,848 m

Height of one floor = 4 m

Number of floors = $8,848 \div 4 = 2,212$ Floors

10. (a) Ascending order (smallest to greatest):

334, 445, 456, 673, 784, 982

Descending order (greatest to smallest):

982, 784, 673, 456, 445, 334

- (b) – (d) same as above

11. Formation of Number

Raman forms the number: 31268

Mona has the digits: 0, 5, 7, 9 and one remaining card (4)

She has already arranged: 0 5 7 9

To make a 5-digit number greater than 31268, Mona should place the remaining digit 4 in the left of 0 to make: 4 0 5 7 9

Practice Time 1C

1. (a) $132 \times 5 = 132 \times \frac{10}{2} = \frac{1320}{2} = 660$

(b) $89 \times 11 = 0 \mid 89 \mid 0 = 0 + 8 \mid 8 + 9 \mid 9 + 0$
 $= 8 \mid 17 \mid 9 = 8 + 1 \mid 7 \mid 9 = 979$

(c) $48 \times 25 = 48 \times \frac{100}{4} = \frac{4800}{4} = 1200$

- (d) Same as part (c).

(e) $224 \times 125 = 224 \times \frac{1000}{8} = \frac{224000}{8} = 28,000$

(f) $352 \times 625 = 352 \times \frac{10,000}{16} = \frac{35,20,000}{16}$
 $= 2,20,000$

- (g) Same as part (f).

(h) $3823 \times 50 = 3823 \times \frac{100}{2} = \frac{382300}{2}$
 $= 191,150$

(i) $98 \times 92 = 9 \times 10 \mid 8 \times 2 = 9016$



(j) Same as part (b)

$$(k) 78 \times 51 = \frac{1}{2} \times 78 \mid 78 = 3978$$

(l) Same as part (i)

2. Each copy has 11 pages, and 13,456 copies are printed daily.

$$\begin{aligned} \text{Total pages} &= 13,456 \times 11 = 13,456 \times (10 + 1) \\ &= 134,560 + 13,456 \\ &= 148,016 \text{ pages} \end{aligned}$$

Fast Check (Page 23)

The number whose letters are in alphabetical order is 'Forty'.

$F < O < R < T < Y$ in alphabetical order.

Think Tank (Page 23)

American System: The smallest number such that the number of letters in its name is equal to the number of digits in its numeral is .

It has 10 digits, and when written in words as one 'billion', it has $3 + 7 = 10$ letters.

Indian System: The smallest number such that the number of letters in its name is equal to the number of digits in its numeral is .

It has 7 digits, and when written in words as 'ten lakh', it has $3 + 4 = 7$ letters.

Practice Time 1D

- (a) Adding 4,63,128 and 4,19,682, we get 8,82,810. Since this is less than 9,00,000, Nishtha is correct.
(b) As 8,82,810 is more than 8,50,000, the sum is greater than 8,50,000
(c) The exact sum is 8,82,810
- On adding the two lengths, the total wire is 1,11,272 m. Rounding each to the nearest thousand (65,000 and 46,000), the estimated total is 1,11,000 m.
- Rounding to the nearest thousand gives 25,000; 7,000; 9,000 and 1,000. Their estimated sum is 42,000.
- Comparing the requirement and supply from factory P, the remaining quantities to be supplied by Q are 20 kg to A, 50 kg to B and 80 kg to C.
Total quantity supplied by Q = 20 kg + 50 kg + 80 kg = 150 kg

Total quantity supplied by P = 60 kg + 40 kg + 20 kg = 120 kg

Therefore, exact payments:

$$\text{For P} = 120 \times 20 = ₹2400$$

$$\text{For Q} = 150 \times 20 = ₹3000$$

Estimated value:

$$\text{For P} = 100 \times 20 = ₹2000$$

$$\text{For Q} = 200 \times 20 = ₹4000$$

- (a) Subtracting, the difference is 9,73,108, which is greater than 9,50,000.
(b) As this value is nearer 10,00,000 and is less than 10,00,000, Nitya's estimate is closer.
- Round each factor to the nearest tens:
 $63,124 \approx 63,120$ and $682 \approx 680$.
Now multiply: $63,120 \times 680 = 42,921,600$.
Therefore, the estimated product (to the nearest tens) is 42,921,600.
- (a) On rounding to the nearest ten, 261 (A) and 263 (B) both round to 260.
Hence, flags A and B are closest to 260.
(b) On rounding to the nearest ten, 267 (C) and 269 (D) both round to 270.
Hence, flags C and D are closest to 27.
- To estimate $5,875 \div 697$, first round to the nearest hundred.
 $5,875 \approx 5,900$ and $697 \approx 700$.
Estimated quotient = $5,900 \div 700 \approx 8$.
Now find the actual value: $5,875 \div 697 \approx 8.43$.
Next, estimate to the nearest ten. $5,875 \approx 5,880$ and $697 \approx 700$.
Estimated quotient ≈ 8.4 .
Since 8.4 is closer to 8.43 than 8, the nearest-ten estimate is closer.
- Round each amount to the nearest thousand.
 $13,568 \approx 14,000$ and $26,856 \approx 27,000$.
Estimated total = 41,000.
As ₹41,000 is more than ₹37,000, the manager has enough money.
Yes, this can be known by estimation without exact calculation.
- Round to the nearest tens: $22 \approx 20$, and $27 \approx 30$.
Estimated total ≈ 50 coloured pencils.
- Round 213 to 200.
Estimated number of books = $30 \times 200 = 6,000$ books.

12. Round $19 \approx 20$ and $42 \approx 40$.
Estimated total = $20 \times 40 = 800$ pancakes.
13. Round $49 \approx 50$ and $24 \approx 20$.
Estimated total = $50 \times 20 = 1,000$.
So, Allen's estimate of about 1,000 animals is reasonable.

Chapter Assessment

- A. 1. The greatest 4-digit number from 5, 7, 8, 9 is 9875, and the smallest is 5789.
Their sum = $9875 + 5789 = 15664$.
Therefore, the correct option is (a).
2. To form the greatest number, arrange digits in descending order: 9, 7, 6, 5, 3 \rightarrow 97653.
Therefore, the correct option is (b).
3. Estimate by rounding: $944 \approx 900$, $88 \approx 90$.
Estimated product = $900 \times 90 = 81,000 \approx 80,000$.
Therefore, the correct option is (d).
4. Estimate: $742 \approx 700$, $12 \approx 10$.
 $700 \div 10 = 70$.
Therefore, the correct option is (b).
5. $4 \times 10000 + 3 \times 1000 + 9 \times 100 + 8 \times 10 + 2 = 40000 + 3000 + 900 + 80 + 2 = 43982$.
Therefore, the correct option is (b).
- B. 1. 5,00,000 is written as 500,000 in the American system (true).
But grouping patterns are not the same (false).
Therefore, the correct option is (c).
2. Estimation helps in quick calculation (true).
Rounding simplifies operations (true and explains A).
Therefore, the correct option is (a).
3. 3,50,000 rounds to 4,00,000 (true).
50,000 or more rounds up (true and explains A).
Therefore, the correct option is (a).
- C. 1. $11,63,128 \approx 10,00,000$
 $4,90,020 \approx 5,00,000$
Difference $\approx 5,00,000$.
2. $62 \times 51 = 3162$.
3. 85712 rounded to nearest 100
4. $85400 = 8 \times 10000 + 5 \times 1000 + 4 \times 100$.
5. The greatest 7-digit number is 99,99,999. By adding 1 to the greatest 7-digit number, we get 1,00,00,000 (one crore).
- D. 1. To form a word of more than 1 lakh (100,000) letters
Using *pneumonoultramicroscopicsilicovolcanoconiosis* (45 letters):
 $100000 \div 45 \approx 2222$ with some letters short.
So, $2222 + 1 = 2223$ times are needed.
Using *supercalifragilisticexpialidocious* (34 letters):
 $100000 \div 34 \approx 2941$ with some letters short.
So, $2941 + 1 = 2942$ times are needed.
2. Height of Mount Everest = 29,032 ft, height of one statue = 369 ft.
 $29,032 \div 369 \approx 78.7$.
So, about 79 statues are needed.
3. Length of NH 44 = 3745 km, NH 118 = 5 km.
 $3745 \div 5 = 749$.
So, about 749 highways of 5 km make NH 44.
4. To get the largest number after striking out 8 digits, keep the largest digits in order.
From 987654321234567, the largest 7-digit number formed is 9876567.
5. Digits from 1–9 give 9 digits.
Digits from 10–99 give digits $90 \times 2 = 180$ digits.
Total so far = 189.
The 500th digit lies among 3-digit numbers.
Remaining $500 - 189 = 311$.
 $311 \div 3 = 103$ remainder 2.
So, it is the 2nd digit of the 104th three-digit number. 104th three-digit number = 203.
The 2nd digit is 0.
500th digit = 0
6. As $2 \rightarrow 7$, $4 \rightarrow 8$, $5 \rightarrow 2$, $7 \rightarrow 4$, $8 \rightarrow 5$. If we press 2, 4, 5, 7, 8, we get the same numbers on the screen.
7. (a) 2 times (+10000) + 8 times (+100)
(b) 9 times (+10000) + 3 times (+1000) + 4 times (+100) + 2 times (+10)
(c) 1 times (+100000) + 2 times (+10000) + 4 times (+100) + 9 times (+10) + 3 times (+1)
(d) 7 times (+1000000) + 2 times (+10000) + 5 times (+1000) + 6 times (+100) + 5 times (+10) + 4 times (+1)
(e) 6 times (+1000) + 5 times (+100) + 3 times (+10)

- (f) 1 time (+10000) + 2 times (+1000) + 3 times (+100) + 4 times (+10) + 6 times (+1)
- (g) 7 times (+10000) + 2 times (+100) + 4 times (+10) + 5 times (+1) (Answer may vary)
8. (a) $150000 + 70000 - 4000 \times 5$
 (b) $70000 \times 5 + 150000 + 4000 \times 20$
 (c) $70000 \times 20 - 150000 - 4000 - 300 \times 5$
 (d) $4000 \times 150000 \div 300 + 70000 + 13000 + 20 \times 5$ (Answer may vary)

Challenge Question

TWENTY NINE (we can write it using 29 matchsticks)

Mental Maths

1. We start by counting how many digits are in each group of numbers:

- 1–9 → 9 numbers → 1 digit each → 9 digits
- 10–99 → 90 numbers → 2 digits each → $90 \times 2 = 180$ digits
- 100–500 → 401 numbers → 3 digits each → $401 \times 3 = 1203$ digits

Now, we locate the 250th digit.

- Digits 1–9 cover the first 9 digits.
- Digits 10–99 cover digits 10 to 189.
- Therefore, the 250th digit lies in the 3-digit numbers (100–500).

Next, we find its exact position within 3-digit numbers:

$$250 - 189 = 61$$

So, the 250th digit is the 61st digit among 3-digit numbers.

Since each 3-digit number has 3 digits:

$$61 \div 3 = 20 \text{ remainder } 1$$

- This means 20 complete numbers have passed, and the 250th digit is the first digit of the next number.
 - The 21st 3-digit number (starting from 100) is: $100 + 20 = 120$.
 - The first digit of 120 is 1.
2. To make the largest number, we need to keep the largest digits in order from left to right.
- Original number: 9876543210
 - Keep the first five largest digits: 98765

- Strike out the remaining five digits: 4 3 2 1 0
- So, the correct answer is 98765.

3. 1 lakh = 1,00,000

1 thousand = 1,000

$$\text{Number of thousands} = \frac{1,00,000}{1,000} = 100$$

4. (a) $96 \times 25 = 96 \times \frac{100}{4} = \frac{9600}{4} = 2400$

(b) $45 \times 11 = 0 \mid 45 \mid 0 = 0 + 4 \mid 4 + 5 \mid 5 + 0 = 495$

(c) $54 \times 56 = 5 \times 6 \mid 4 \times 6 = 3024$

5. (a) Round each number to the highest place value:
 $2000 + 8000 = 10,000$

- (b) Round each number to the highest place value:
 $80,000 + 3,000 = 83,000$

CHAPTER 2: ARITHMETIC EXPRESSIONS

Let's Recall

1. We first multiply and then subtract.

$$3 \times 20 = 60$$

$$60 - 16 = 44$$

Among the options,

$$20 + 24 = 44$$

So, the correct option is (c).

2. First add and then subtract.

$$36 + 14 = 50$$

$$50 - 29 = 21$$

Among the options,

$$12 + 9 = 21$$

So, the correct option is (b).

3. First add and then subtract.

$$14 + 12 = 26$$

$$26 - 7 = 19$$

Among the options,

$$12 + 7 = 19$$

So, the correct option is (a).

Fast Check (Page 32)

(i) $11 + 13 = 24$, $7 \times 8 = 56$

Therefore,

$$11 + 13 < 7 \times 8$$

(ii) $19 \times 3 = 57$, $63 - 8 = 55$

Therefore,

$$19 \times 3 > 63 - 8$$

$$(iii) 23 - 7 = 16, 2 \times 8 = 16$$

Therefore,

$$23 - 7 = 2 \times 8$$

Practice Time 2A

- $8 + 9.$
 - $7 \times 6.$
 - $24 \div 4.$
 - $9 - 3.$
 - $(8 \times 10) + 4.$
 - $(12 \div 4) + 8.$
 - $12 + 39.$
 - $34 - 9.$
 - $87 + 56 + 98 + 100.$
 - $(45 + 35) \div 5$
- Add 4 and 5, and then add 7 to the result.
 - Multiply 2 by 9 and subtract 7 from the result.
 - Multiply 12 by 4 and divide the product by 3.
 - Multiply 5 by 10 and then multiply the result by 2.
- $17 + 6 = 23, 14 + 9 = 23$
So, $17 + 6 = 14 + 9$
 - $7 \times 6 = 42, 28 + 14 = 42$
So, $28 + 14 = 7 \times 6$
 - $144 \div 2 = 72, 9 \times 8 = 72$
So, $9 \times 8 = 144 \div 2$
 - $253 - 125 = 128, 32 \times 4 = 128$
So, $253 - 125 = 32 \times 4$
- 1 dozen = 12 bananas
Total bananas = 10×12
Rotten bananas = 6
Bananas left = $(10 \times 12) - 6$
Therefore, the required arithmetic expression is $(10 \times 12) - 6$.
- Fare per day = ₹45
Number of days = 28
Total monthly fare = 45×28
Total monthly fare for both sides = $2 \times 45 \times 28$
Therefore, the required arithmetic expression is $\text{₹}(2 \times 45) \times 28$.
- Books on each shelf = 483
Number of shelves = 32
Total books = 483×32
Therefore, the required arithmetic expression is 483×32 .
- $145 + 189 = 334, 146 + 185 = 331$
So, $145 + 189 > 146 + 185$
 - $373 - 145 = 228, 372 - 144 = 228$
So, $373 - 145 = 372 - 144$

$$(c) 464 + 785 = 1249, 463 + 789 = 1252$$

So, $464 + 785 < 463 + 789$

$$(d) 1000 + 245 = 1245, 1025 + 250 = 1275$$

$$1000 + 245 < 1025 + 250$$

$$(e) 110 - 78 = 32, 112 - 75 = 37$$

So, $110 - 78 < 112 - 75$

$$8. 37 - 18 = 19, 175 \div 5 = 35, 17 + 19 = 36,$$

$$5 \times 19 = 95, 14 \times 12 = 168.$$

Therefore, the correct increasing order is

$$37 - 18 < 175 \div 5 < 17 + 19 < 5 \times 19 < 14 \times 12$$

$$(c) < (b) < (e) < (d) < (a)$$

Fast Check (Page 35)

We know that terms are the parts of an expression which are separated by the '+' sign, provided the expression has no brackets.

| Expression | Expression as the sum of its terms | Terms |
|------------------------|------------------------------------|--------------------------|
| $13 - 2 + 6$ | $13 + (-2) + 6$ | 13, -2, 6 |
| $5 + 6 \times 3$ | $5 + (6 \times 3)$ | 5, 6×3 |
| $4 + 15 - 9$ | $4 + 15 + (-9)$ | 4, 15, -9 |
| $23 - 2 \times 4 + 16$ | $23 + (-2) \times 4 + 16$ | 23, (-2×4) , 16 |
| $28 + 19 - 8$ | $28 + 19 + -8$ | 28, 19, -8 |

Practice Time 2B

- $13 - 17 - 12$
Terms: 13, -17, -12
As a sum of terms: $13 + (-17) + (-12)$
 - $-10 + 11 - 13$
Terms: -10, 11, -13
As sum of terms: $(-10) + 11 + (-13)$
 - $29 - 11 + 4 \times 5$
Terms: 29, -11, 4×5
As sum of terms: $29 + (-11) + (4 \times 5)$
 - $14 - 3 \times 4 + 10$
Terms: 14, -3×4 , 10
As sum of terms: $14 + (-3 \times 4) + 10$
 - $12 \div 3 - 2 \times 3 + 5$
Terms: $12 \div 3$, -2×3 , 5
As sum of terms: $(12 \div 3) + (-2 \times 3) + 5$
 - $-18 \times 3 + 27 \div 9 - 4$
Terms: -18×3 , $27 \div 9$, -4
As sum of terms: $(-18 \times 3) + (27 \div 9) + (-4)$
 - $49 - 7 \times 8 + 12$
Terms: 49, -7×8 , 12
As sum of terms: $49 + (-7 \times 8) + 12$

$$(h) 112 \div 4 + 34 \times 12$$

$$\text{Terms: } 112 \div 4, 34 \times 12$$

$$\text{As sum of terms: } (112 \div 4) + (34 \times 12)$$

$$(i) 1 - 2 + 3 - 5 \times 6 + 7$$

$$\text{Terms: } 1, -2, 3, -5 \times 6, 7$$

$$\text{As sum of terms: } 1 + (-2) + 3 + (-5 \times 6) + 7$$

$$2. (a) 100 - 2 \times (5 + 3) = 100 - 2 \times 8 \\ = 100 - 16 = 84$$

$$(b) (100 - 27) + 53 = 73 + 53 = 126$$

$$(c) 12 - (4 + 6) \times 5 + 100 = 12 - 10 \times 5 + 100 \\ = 12 - 50 + 100 = 62$$

$$(d) 7 - (8 \div 4) + (5 - 7) = 7 - 2 + (-2) \\ = 7 - 2 - 2 = 3$$

$$(e) (12 + 6) \times 5 - (3 \times 4) = 18 \times 5 - 12 \\ = 90 - 12 = 78$$

$$(f) 20 - (24 - 10) + 7 = 20 - 14 + 7 = 13$$

$$(g) (48 \div 16) \times 2 - (17 - 9) = 3 \times 2 - 8 \\ = 6 - 8 = -2$$

$$(h) 18 - (10 - 8) + 7 = 18 - 2 + 7 = 23$$

$$(i) (3 + 3) \times 3 - (3 \times 3) = 6 \times 3 - 9 \\ = 18 - 9 = 9$$

3. Each person gets 2 slices.

$$\text{Total people} = 10$$

$$\text{Total slices needed} = 10 \times 2$$

Each pizza has 4 slices.

$$\text{Expression: } \frac{(10 \times 2)}{4}$$

$$\text{Terms: } \frac{10 \times 2}{4}$$

$$\text{Now, } \frac{(10 \times 2)}{4} = \frac{20}{4} = 5$$

So, 5 pizzas are ordered.

4. Wheat bought = 200 kg

$$\text{Each packet} = 5 \text{ kg}$$

$$\text{Packets made} = 200 \div 5 = 40$$

$$\text{Already had packets} = 6$$

$$\text{Expression: } (200 \div 5) + 6$$

$$\text{Terms: } 200 \div 5, 6$$

$$40 + 6 = 46$$

5. Chalk boxes = 4

$$\text{Chalks in each box} = 20$$

$$\text{Total chalks} = 4 \times 20 = 80$$

$$\text{One chalk taken from each box} = 4 \times 1 = 4$$

$$\text{Chalks left} = 80 - 4 = 76$$

$$6. \text{ Total students} = 45 + 48 = 93$$

$$\text{Number of classes} = 3$$

$$\text{Students in each class} = 93 \div 3 = 31 \text{ students.}$$

7. Full ticket fare = 2920, Half ticket fare = 1700.

$$\text{Cost of tickets} = 3 \times 2920 + 1700$$

$$\text{Additional charges} = 30 + 20 = 50$$

$$\text{Total amount paid} = (3 \times 2920) + 1700 + 50$$

$$= 8760 + 1700 + 50$$

$$= ₹10,510$$

8. Money given to each = ₹1,00,000

$$\text{Swami doubles his money: } 2 \times 1,00,000$$

$$\text{Narayan has half the money left: } 1,00,000 \div 2$$

$$\text{Expression: } (2 \times 1,00,000) + (1,00,000 \div 2)$$

$$\text{Now, } (2 \times 1,00,000) + (1,00,000 \div 2) = 2,00,000$$

$$+ 50,000 = ₹2,50,000$$

Fast Check (Page 40)

$$(a) 49 \times 26 = 26 \times 49$$

(Using commutative property)

$$26 \times 49 = 26 \times (50 - 1) \quad (\text{Since } 49 = 50 - 1)$$

$$= 26 \times 50 - 26 \times 1$$

(Applying distributive property)

$$= 1300 - 26 = 1274$$

$$(b) \text{ Similarly as part a, } 51 \times 18 = 18 \times 51$$

$$= 18 \times (50 + 1) = (1 \times 18) + (50 \times 18)$$

$$= 900 + 18 = 918$$

Practice Time 2C

$$1. (a) 7 \times 12 = 12 \times 7$$

Here, the order of the numbers is changed without changing the result.

So, it shows the commutative property of multiplication.

$$(b) 232 + (786 + 91) = (232 + 786) + 91$$

Here, the grouping of numbers is changed without changing the result.

So, it shows the associative property of addition.

(c) Same as part (a), commutative property of multiplication.

$$(d) 665 + 855 = 855 + 665$$

Here, the order of addition is changed without changing the result.

So, it shows the commutative property of addition.

(e) Same as part (b), associative property of addition.

(f) Same as part (a), commutative property of multiplication.

(g) $234 \times (876 + 124) = 234 \times 876 + 234 \times 124$
Here, multiplication is distributed over addition.

So, it shows the distributive property of multiplication over addition.

(h) $999 \times (1000 - 12) = 999 \times 1000 - 999 \times 12$
Here, multiplication is distributed over subtraction.

So, it shows the distributive property of multiplication over subtraction.

2. (a) $2 \times (5 + 7) = 2 \times 5 + 2 \times 7$

(Using distributive property of multiplication over addition)

(b) $(7 - 3) \times 4 = 7 \times 4 - 3 \times 4$

(using distributive property of multiplication over subtraction)

(c) $3 \times (5 + 8) = 3 \times 5 + 3 \times 8$

(using distributive property of multiplication over addition)

(d) $(9 + 2) \times 4 = 9 \times 4 + 2 \times 4$

(using distributive property over addition)

(e) $7 \times (6 + 4) = 7 \times 6 + 7 \times 4$

(using distributive property of multiplication over addition)

(f) $(11 + 6) \times 4 = 11 \times 4 + 6 \times 4$

(using distributive property of multiplication over addition)

(g) $3 \times (5 + 2) = 3 \times 5 + 3 \times 2$

(using distributive property of multiplication over addition)

(h) $(6 + 3) \times 4 = 6 \times 4 + 3 \times 4$

(using distributive property of multiplication over addition)

(i) $5 \times (9 - 2) = 5 \times 9 - 5 \times 2$

(using distributive property of multiplication over subtraction)

(j) $(5 - 2) \times 7 = 5 \times 7 - 2 \times 7$

(using distributive property of multiplication over subtraction)

3. (a) $48 \times 77 = 48 \times (70 + 7)$

$$= 48 \times 70 + 48 \times 7$$

$$= 3360 + 336 = 3696$$

(b) $52 \times 36 = (50 + 2) \times 36$

$$= 1800 + 72 = 1872$$

(c) $98 \times 76 = (100 - 2) \times 76$

$$= 7600 - 152 = 7448$$

(d) $102 \times 48 = (100 + 2) \times 48$

$$= 4800 + 96 = 4896$$

(e) $49 \times 51 = (50 - 1) \times (50 + 1)$

$$= 2500 - 1 = 2499$$

(f) $997 \times 254 = (1000 - 3) \times 254$

$$= 254000 - 762 = 253238$$

(g) $105 \times 42 = (100 + 5) \times 42$

$$= 4200 + 210 = 4410$$

(h) $97 \times 93 = (100 - 3) \times (100 - 7)$

$$= 10000 - 700 - 300 + 21 = 9021$$

4. Given $37 \times 32 = 1184$

(a) $47 \times 32 = (37 + 10) \times 32 = 37 \times 32 + 10 \times 32$

$$= 1184 + 320 = 1504$$

(b) $37 \times 42 = 37 \times (32 + 10) = 37 \times 32 + 37 \times 10$

$$= 1184 + 370 = 1554$$

(c) $37 \times 22 = 37 \times (32 - 10) = 37 \times 32 - 37 \times 10$

$$= 1184 - 370 = 814$$

(d) $27 \times 32 = (37 - 10) \times 32 = 37 \times 32 - 10 \times 32$

$$= 1184 - 320 = 864$$

5. $47 + 24 + 19 = (47 + 24) + 19 = 71 + 19 = 90$

The numbers are grouped to make the addition.
The associative property of addition is used.

6. Sweets in one box = $6 + 4 + 2 = 12$

Total sweets sold = $1000 \times 12 = 12000$

7. Daily supply = $105 + 27 = 132$ kg

Weekly supply = $7 \times 132 = 924$ kg

Distributive property of multiplication over addition help to solve his problem

Maths Fun (Page 42)

$$4 \times (4 + 4 + 6 + 6) = 80$$

$$8 \times 4 + 8 \times 6 = 80$$

Mental Maths (Page 42)

1. $123 - 45 - 67 + 89 = 100;$

$$(9 \times 8) + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 100$$

2. (a) $4 \times (5 + 1) = 24$ (b) $2 \times (3 + 9) = 24$

(c) $3 \times (2 + 6) = 24$ (d) $4 \times (4 + 2) = 24$

(Answer may vary)



Chapter Assessment

- A. 1.** 3 more than the double of the difference of 11 and 4.
Difference of 11 and 4 = $11 - 4$
Double = $2 \times (11 - 4)$
3 more than this = $2 \times (11 - 4) + 3$
Correct option: (b)
- 2.** Expression: $15 - 13 \times 3 - 10$
 $= 15 + (-13 \times 3) + (-10)$
Terms are: 15, -13×3 , -10
Correct option: (c)
- 3.** Given expression: $73 - 18 - 21$
Rearranging terms without changing signs:
 $-21 + 73 - 18$
Correct option: (b)
- 4.** $107 \times 104 - 107 \times 44 = 107(104 - 44)$
 $= 107 \times 60 = 6420$
Correct option: (a)
- 5.** $2 \times (43 + 24) = 2 \times 43 + 2 \times 24$ (using distributive property)
Correct option: (c)
- B. 1.** $100 - (15 + 56) = 100 - 15 - 56$
Both statements are true, and the reason explains the assertion.
Correct option: (a)
- 2.** $4 \times 5 + 3 \times 5 = (4 + 3) \times 5$
Both are true, and the reason correctly explains it.
Correct option: (a)
- 3.** $5 \times (4 + 3) \neq 5 \times 4 + 3$
Assertion is false, Reason is true.
Correct option: (d)
- C. 1.** $823 \times \underline{348} = 348 \times \underline{823}$
(Using commutative property for multiplication)
- 2.** $234 \times (\underline{375} + 125) = 234 \times 375 + \underline{234} \times 125$
(Using distributive property of multiplication over addition)
- 3.** $547 \times (938 - 138) = 547 \times 938 - 547 \times \underline{138}$
(Using distributive property of multiplication over subtraction)
- 4.** $(\underline{234} + \underline{266}) \times 767 = 767 \times 234 + \underline{767} \times 266$
(Using distributive property of multiplication over addition)
- 5.** $28 \times (24 \times \underline{58}) = (58 \times \underline{28}) \times 24$
(Using associative property of multiplication)
- 6.** $4576 + \underline{1298} = 1298 + \underline{4576}$
(Using commutative property for addition)
- D. 1. F:** The expression $12 + 17 - 19$ has the terms 12, +17 and -19 .
So, -17 is not a term of the given expression.
- 2. F:** 7 times the sum of 8 and 9 means $7 \times (8 + 9)$, not $8 \times (7 + 9)$.
- 3. F:** Explanation: $(7 - 2) \times 8 = 5 \times 8 = 40$
 $7 \times (8 - 2) = 7 \times 6 = 42$
Since the values are different, the statement is false.
- 4. F:** $5 \times 4 \times 3 = 60$, $8 \times 9 = 72$. Since $60 < 72$, the given inequality is false.
- 5. T:** This follows the distributive property of multiplication over addition:
 $2 \times (33 + 57) = 2 \times 33 + 2 \times 57$
- E. 105 + 114 - 137 = 82**
 $49 + (7 \times 3) - 50 = 20$
 $200 - 2(48 + 52) = 200 - 2 \times (100) = 0$
 $(18 - 11) \times 6 = 7 \times 6 = 42$
 $(17 \times 18) - 150 = 306 - 150 = 156$
Therefore, the correct match is
 $1 - (iv)$, $2 - (v)$, $3 - (i)$, $4 - (iii)$, $5 - (ii)$
- F. 1. (a)** Simplifying using the distributive property, we get
 $11 \times 40 - 11 \times 9 = 11 \times (40 - 9)$
 $= 11 \times 31$
 $= 341$
- (b)** $(25 + 35) + 20 = 60 + 20 = 80$
- (c)** Taking 6 as a common factor and then simplifying, we get
 $134 \times 6 + 98 \times 6 + 6 \times 72$
 $= 6 \times (134 + 98 + 72)$
 $= 6 \times 304 = 1824$
- (d)** $6 \times (23 + 17) = 6 \times 40 = 240$
Next, combine the last two terms using the distributive property:
 $4 \times 45 + 4 \times 28 = 4 \times (45 + 28) = 4 \times 73$
 $= 292$
Add both results: $240 + 292 = 532$
Therefore,
 $6 \times (23 + 17) + 4 \times 45 + 4 \times 28 = 532$
- 2.** $(5 \times 5 + 5) \div 5 = 6$ (Answer may vary)

3. Total number of students: $146 + 148 = 294$
Students are divided equally into 3 classes.
This gives the expression:
 $(146 + 148) \div 3$
4. The given expression can be rewritten as:
 $2 \times 3 + (-3 \times 4) + (4 \times 5) + (-5 \times 6) + (6 \times 7)$
 $+ (-7 \times 8) + (8 \times 9) + (-9 \times 10)$
The terms in the expression are:
 $2 \times 3, -3 \times 4, 4 \times 5, -5 \times 6, 6 \times 7, -7 \times 8,$
 $8 \times 9, -9 \times 10$
We can evaluate the given expression as:
 $2 \times 3 + (-3 \times 4) + (4 \times 5) + (-5 \times 6) + (6 \times 7)$
 $+ (-7 \times 8) + (8 \times 9) + (-9 \times 10)$
 $= 6 - 12 + 20 - 30 + 42 - 56 + 72 - 90$
 $= (6 - 12) + (20 - 30) + (42 - 56) + (72 - 90)$
 $= (-6) + (-10) + (-14) + (-18)$
 $= -48$
5. After 3 years, each child's age increases by 3 years.
Total increase in age: $3 + 3 + 3 = 9$
The arithmetic expression to represent this is: $28 + (3 \times 3)$
Now, $28 + (3 \times 3) = 28 + 9 = 37$
Therefore, total age after 3 years = 37 years
6. Muskan's movement: Steps forward = 21,
Steps backward = 17
Resultant steps: $21 - 17 = 4$
So, Muskan moves 4 steps forward.
Shrija's movement: Steps backwards = 17,
Steps forward = 21
Resultant steps: $-17 + 21 = 4$
So, Shrija also moves 4 steps forward.
Therefore, both Muskan and Shrija have the same resultant movement, which is 4 steps forward.
7. **Method 1:** In each row, there are two 4's and two 7's.
So, the sum of numbers in one row is:
 $4 + 7 + 7 + 4 = 22$
There are 4 such rows in the grid. So, the sum of the numbers in the grid can be shown by the expression
 $4 \times (4 + 7 + 7 + 4)$
Therefore, the sum of the numbers in the grid is:
 $4 \times (4 + 7 + 7 + 4) = 4 \times 22 = 88$

Method 2: In the entire grid, there are eight 4's and eight 7's. The expression representing their sum is:

$$(8 \times 4) + (8 \times 7)$$

Therefore, the sum of the numbers in the grid is:

$$(8 \times 4) + (8 \times 7) = 32 + 56 = 88$$

(Answer may vary)

8. (a) Meera bought 2 Science books at ₹120 each, 3 storybooks at ₹80 each, and 1 dictionary for ₹250.

The total cost of the Science books is:

$$2 \times 120 = ₹240$$

The total cost of the storybooks is:

$$3 \times 80 = ₹240$$

The cost of the dictionary is ₹250.

Therefore, the arithmetic expression for the total cost before discount is:

$$(2 \times 120) + (3 \times 80) + 250$$

- (b) A special combo discount of ₹100 was applied. Therefore, the total amount Meera paid after the discount is:

$$(2 \times 120) + (3 \times 80) + 250 - 100$$
$$= 730 - 100 = 630$$

So, Meera paid a total of ₹630 after the discount.

- (c) Meera also bought a Math Activity book for ₹170 and received an extra discount of ₹15 on her total purchase.

Adding the cost of the Math Activity book to the total amount paid earlier:

$$₹630 + ₹170 = ₹800$$

Subtracting the extra discount:

$$₹800 - ₹15 = ₹785$$

Thus, Meera paid ₹785.

Challenge Question (Page 45)

- In the first attempt, the monkey takes 3 steps forward, and each forward step = 2 m. So, the distance climbed forward in one attempt is: $3 \times 2 = 6$ m
- In the second attempt, he slips 2 steps backward, and each backward step = 1 m. So, the distance slipped backwards is: $2 \times 1 = 2$ m
- Thus, the net distance gained in one complete cycle (forward + backward) is: $6 - 2 = 4$ m per cycle



- The monkey needs to climb a total height of 100 m. Since each complete cycle gains 4 m, the number of complete cycles required before reaching near the top is: $(100 \div 4) - 1 = 24$
- After 24 complete cycles, the monkey climbs: $24 \times 4 = 96$ m
- Now, the remaining distance to reach the top is: $100 - 96 = 4$ m
- In this final partial cycle, the monkey only needs to take 2 forward steps (each 2 m) to reach 100 m. He does not slip back in this last cycle. Each complete cycle involves 3 forward steps + 2 backward steps = 5 steps. Therefore, the expression for the total number of steps is $(100 \div 4 - 1) \times 5 + 2$.
- Total steps required = $(100 \div 4 - 1) \times 5 + 2$
 $= 24 \times 5 + 2 = 120 + 2 = 122$

CHAPTER 3: A PEEK BEYOND THE POINT

Let's Recall

1. (a) Since $5 \times 2 = 10$, we can find the equivalent fraction of $\frac{2}{5}$ with a denominator 10 as:

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

Therefore, the equivalent fractions of $\frac{2}{5}$ with a denominator 10 is $\frac{4}{10}$.

Similarly,

$$(b) \frac{2}{5} = \frac{2 \times 20}{5 \times 20} = \frac{40}{100}$$

The equivalent fractions of $\frac{2}{5}$ with a denominator of 100 is $\frac{40}{100}$.

$$(c) \frac{2}{5} = \frac{2 \times 200}{5 \times 200} = \frac{400}{1000}$$

The equivalent fractions of $\frac{2}{5}$ with a denominator of 1000 is $\frac{400}{1000}$.

2. (a) Since $5 \times 5 = 25$, we have

$$\frac{5}{20} = \frac{5 \times 5}{20 \times 5} = \frac{25}{100}$$

Therefore, $\frac{5}{20} = \frac{25}{100}$

$$(b) \frac{6}{25} = \frac{6 \times 4}{25 \times 4} = \frac{24}{100}$$

$$(c) \frac{100}{250} = \frac{100 \times 4}{250 \times 4} = \frac{400}{1000}$$

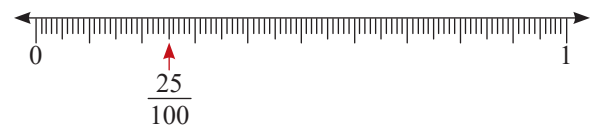
$$(d) \frac{7}{2} = \frac{7 \times 5}{2 \times 5} = \frac{35}{10}$$

$$(e) \frac{4}{5} = \frac{4 \times 2}{5 \times 2} = \frac{8}{10}$$

$$(f) \text{ Since } \frac{36}{100} = \frac{36 \div 4}{100 \div 4} = \frac{9}{25}$$

3. (a) Draw a number line and mark the points 0 and 1 on it. Since the denominator is 100, divide the distance between 0 and 1 into 100 equal parts.

Each small division now represents $\frac{1}{100}$. Starting from 0, count 25 equal divisions towards the right. Mark the point reached after 25 divisions and label it as $\frac{25}{100}$.



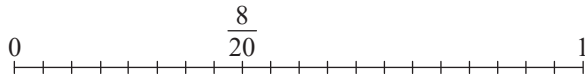
- (b) Draw a number line and mark the points 0 and 1 on it. Since the denominator is 10, divide the distance between 0 and 1 into 10 equal parts.

Each small division now represents $\frac{1}{10}$. Starting from 0, count 6 equal divisions towards the right. Mark the point reached after 6 divisions and label it as $\frac{6}{10}$.



- (c) Draw a number line and mark the points 0 and 1 on it. Since the denominator is 20, divide the distance between 0 and 1 into 20 equal parts.

Each small division now represents $\frac{1}{20}$. Starting from 0, count 8 equal divisions towards the right. Mark the point reached after 8 divisions and label it as $\frac{8}{20}$.



Practice Time 3A

1. The ruler shown is marked in centimetres. Each centimetre is divided into 10 equal small divisions, and each small division represents one-tenth of a centimetre or 1 millimetre. The pencils are placed with one end at 0 cm. To find the length of a pencil, we need to observe the marking where the tip of the pencil ends. Then, count the number of complete centimetres followed by the number of small divisions (in mm), if any.

Therefore, the lengths of the given pencils are:

- (a) 3 cm (b) 5 cm 3 mm = 5.3 cm
 (c) 9 cm 1 mm = 9.1 cm (d) 8 cm 5 mm = 8.5 cm

2. (a) The numbers given are $2, 2\frac{3}{10}, 2\frac{6}{10}$.

On observing the pattern, each number increases by $\frac{3}{10}$.

Adding $\frac{3}{10}$ successively:

$$2\frac{6}{10} + \frac{3}{10} = 2\frac{9}{10}$$

$$2\frac{9}{10} + \frac{3}{10} = 3\frac{2}{10}$$

$$3\frac{2}{10} + \frac{3}{10} = 3\frac{5}{10}$$

$$3\frac{5}{10} + \frac{3}{10} = 3\frac{8}{10}$$

Hence, the completed sequence is

$$2, 2\frac{3}{10}, 2\frac{6}{10}, 2\frac{9}{10}, 3\frac{2}{10}, 3\frac{5}{10}, 3\frac{8}{10}$$

- (b) The numbers given are $8\frac{6}{10}, 7\frac{5}{10}, 6\frac{4}{10}$.

On observing the pattern, each number decreases by $1\frac{1}{10}$.

Subtracting $1\frac{1}{10}$ successively:

$$6\frac{4}{10} - 1\frac{1}{10} = 5\frac{3}{10}$$

$$5\frac{3}{10} - 1\frac{1}{10} = 4\frac{2}{10}$$

$$4\frac{2}{10} - 1\frac{1}{10} = 3\frac{1}{10}$$

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

Hence, the completed sequence is

$$8\frac{6}{10}, 7\frac{5}{10}, 6\frac{4}{10}, 5\frac{3}{10}, 4\frac{2}{10}, 3\frac{1}{10}, 2$$

- (c) The numbers given are $5\frac{7}{10}, 5\frac{3}{10}$.

On observing the pattern, each number decreases by $\frac{4}{10}$.

Subtracting $\frac{4}{10}$ successively:

$$5\frac{3}{10} - \frac{4}{10} = 4\frac{9}{10}$$

$$4\frac{9}{10} - \frac{4}{10} = 4\frac{5}{10}$$

$$4\frac{5}{10} - \frac{4}{10} = 4\frac{1}{10}$$

$$4\frac{1}{10} - \frac{4}{10} = 3\frac{7}{10}$$

Hence, the completed sequence is

$$5\frac{7}{10}, 5\frac{3}{10}, 4\frac{9}{10}, 4\frac{5}{10}, 4\frac{1}{10}, 3\frac{7}{10}$$

- (d) The numbers given are $8\frac{2}{10}, 8\frac{7}{10}, 9\frac{2}{10}$.

On observing the pattern, each number increases by $\frac{5}{10}$.

Adding $\frac{5}{10}$ successively:

$$9\frac{2}{10} + \frac{5}{10} = 9\frac{7}{10}$$

$$9\frac{7}{10} + \frac{5}{10} = 10\frac{2}{10}$$

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

$$10\frac{7}{10} + \frac{5}{10} = 11\frac{2}{10}$$

Hence, the completed sequence is

$$8\frac{2}{10}, 8\frac{7}{10}, 9\frac{2}{10}, 9\frac{7}{10}, 10\frac{2}{10}, 10\frac{7}{10}, 11\frac{2}{10}$$



3. A fraction with denominator 10 is read in tenths, with denominator 100 is read in hundredths, with denominator 1000 is read in thousandths, and so on.

(a) $\frac{23}{10}$: Twenty-three tenths

(b) $3\frac{4}{10}$: Three and four-tenths

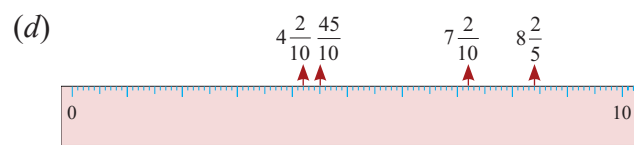
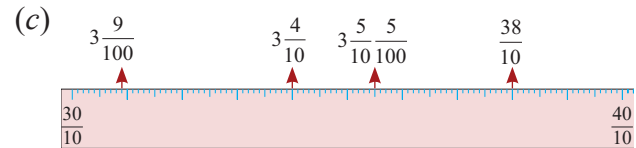
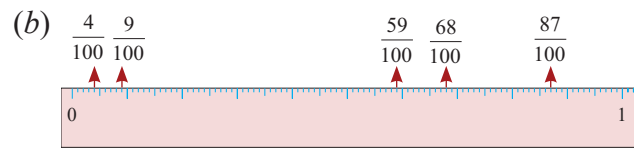
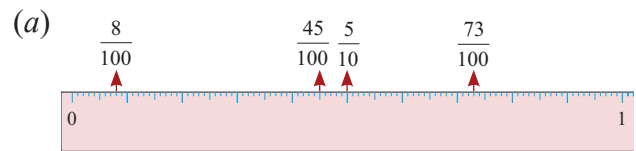
(c) $5\frac{8}{10}\frac{3}{100}$: Five, eight-tenths, and three-hundredths

(d) – (f): Same as above

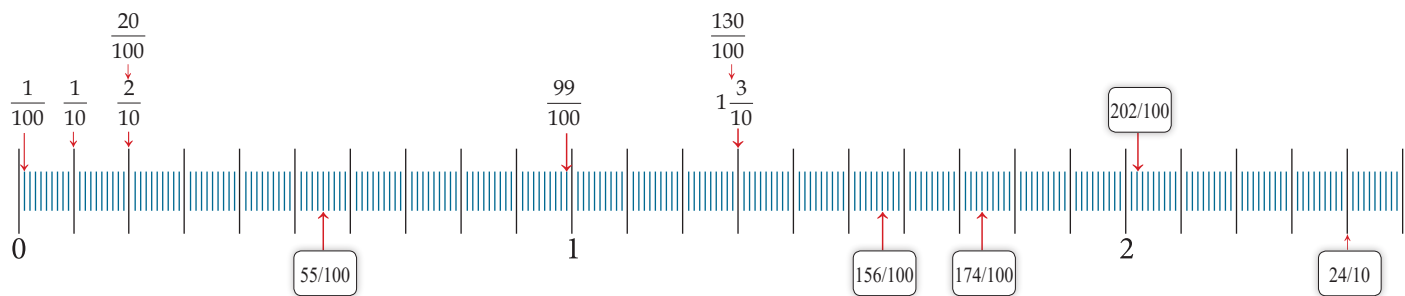
4. Same as question 1.

5. Observe the endpoints and markings of each scale, identify whether the interval is divided into tenths or hundredths, and then count the required number

of divisions to locate and mark each given number correctly.



6. On the given number strip, each big division represents one-tenth $\left(\frac{1}{10}\right)$, and each small division between two big divisions represents one-hundredth $\left(\frac{1}{100}\right)$.



7. (a) Convert all fractions to like fractions by changing them to the highest denominator (such as tenths, hundredths, or thousandths) among the given fractions. Then compare the numerators to arrange them in ascending order.

$$\frac{9}{10} \rightarrow \frac{90}{100}; 9 \rightarrow \frac{900}{100}; \frac{4}{10} \rightarrow \frac{40}{100}; 7\frac{6}{10} \rightarrow \frac{760}{100}$$

Since $40 < 43 < 76 < 90 < 760 < 900$, the correct ascending order of the given numbers is

$$\frac{4}{10} < \frac{43}{100} < \frac{76}{100} < \frac{9}{10} < 7\frac{6}{10} < 9$$

(b) – (d) Same as part (a).

8. (a) Convert all fractions to like fractions by changing them to the highest denominator (such as tenths, hundredths, or thousandths) among the given fractions. Then compare the numerators to arrange them in descending order.

$$\frac{3}{10} \rightarrow \frac{30}{100}; 3\frac{3}{10} \rightarrow \frac{330}{100}; 6\frac{2}{10} \rightarrow \frac{620}{100};$$

$$\frac{89}{10} \rightarrow \frac{890}{100}; 7\frac{5}{10} \rightarrow \frac{750}{100}; 3\frac{75}{100} \rightarrow \frac{375}{100}$$

Since $890 > 750 > 620 > 375 > 330 > 30$, the correct decreasing order of the given numbers is

$$\frac{89}{10} > 7\frac{5}{10} > 6\frac{2}{10} > 3\frac{75}{100} > 3\frac{3}{10} > \frac{3}{10}$$

(b) – (d) Same as part (a).

$$\begin{aligned} 9. (a) \quad & 2\frac{3}{10}\frac{7}{100} + 3\frac{2}{10}\frac{5}{100} \\ &= (2+3) + \left(\frac{3}{10} + \frac{2}{10}\right) + \left(\frac{5}{100} + \frac{7}{100}\right) \\ &= 5 + \frac{5}{10} + \frac{12}{100} = 5 + \frac{5}{10} + \frac{10}{100} + \frac{2}{100} \\ &= 5 + \frac{5}{10} + \frac{1}{10} + \frac{2}{100} = 5 + \frac{6}{10} + \frac{2}{100} = 5\frac{6}{10}\frac{2}{100} \end{aligned}$$

(b) Same as part (a)

$$\begin{aligned} (c) \quad & 13\frac{2}{10}\frac{5}{100} + 17\frac{8}{10}\frac{15}{100} \\ &= (13+17) + \left(\frac{2}{10} + \frac{8}{10}\right) + \left(\frac{5}{100} + \frac{15}{100}\right) \\ &= 30 + \frac{10}{10} + \frac{20}{100} = 30 + 1 + \frac{2}{10} \\ &= 31 + \frac{2}{10} = 31\frac{2}{10} \end{aligned}$$

(d) – (f) Same as above.

$$\begin{aligned} 10. (a) \quad & 12\frac{3}{10} - 5\frac{4}{10}\frac{7}{100} \\ &= 11\frac{13}{10} - 5\frac{4}{10}\frac{7}{100} = 11\frac{10}{10}\frac{30}{100} - 5\frac{4}{10}\frac{7}{100} \\ &= (11-5) + \left(\frac{10}{10} - \frac{4}{10}\right) + \left(\frac{30}{100} - \frac{7}{100}\right) \\ &= 6 + \frac{6}{10} + \frac{23}{100} = 6 + \frac{6}{10} + \frac{20}{100} + \frac{3}{100} \\ &= 6 + \frac{6}{10} + \frac{2}{10} + \frac{3}{100} = 6\frac{8}{10}\frac{3}{100} \end{aligned}$$

(b) – (f) Same as above.

$$\begin{aligned} 11. \quad & \text{The total length of Sonu's arm} \\ &= \text{Length of his lower arm} + \text{length of his upper arm} \\ &= 2\frac{7}{10} + 3\frac{6}{10} = (2+3) + \left(\frac{7}{10} + \frac{6}{10}\right) = 5 + \frac{13}{10} \\ &= 5 + \frac{10}{10} + \frac{3}{10} = 5 + 1 + \frac{3}{10} = 6\frac{3}{10} \end{aligned}$$

Thus, the total length of Sonu's arm is $6\frac{3}{10}$ units.

$$\begin{aligned} 12. \quad & \text{The length of Krishna's leg above the ankle} \\ &= \text{Length of his leg} - \text{length of his ankle} \\ &= 136\frac{8}{10} - 3\frac{4}{10} = (136-3) + \left(\frac{8}{10} - \frac{4}{10}\right) \\ &= 133 + \frac{4}{10} = 133\frac{4}{10} \end{aligned}$$

Thus, the length of Krishna's leg above the ankle is $133\frac{4}{10}$ units.

$$13. \quad \text{Length of celestial Pearl Danio} = 2\frac{4}{10} \text{ cm}$$

$$\text{Length of philippine Goby} = 4\frac{5}{10} \text{ cm}$$

$$\begin{aligned} \text{Difference} &= 4\frac{5}{10} - 2\frac{4}{10} = (4-2) + \left(\frac{5}{10} - \frac{4}{10}\right) \\ &= 2 + \frac{1}{10} = 2\frac{1}{10} \text{ cm} \end{aligned}$$

$$14. \quad \text{Height of tree} = 12\frac{4}{10} \text{ feet}$$

$$\text{Height of plant} = 3\frac{3}{10} \text{ feet}$$

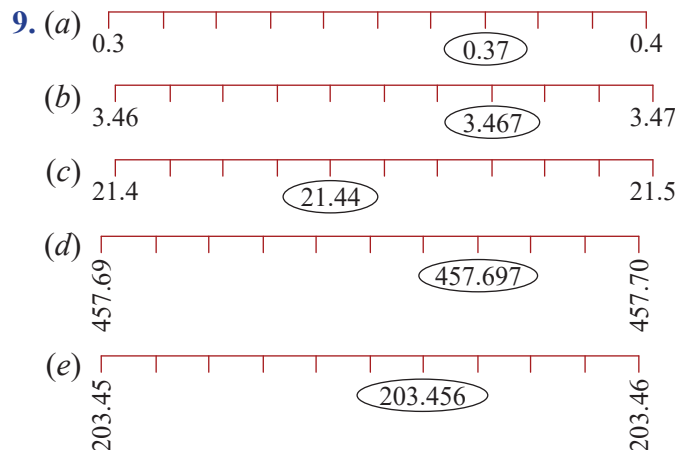
$$\begin{aligned} \text{Difference} &= 12\frac{4}{10} - 3\frac{3}{10} = (12-3) + \left(\frac{4}{10} - \frac{3}{10}\right) \\ &= 9 + \frac{1}{10} = 9\frac{1}{10} \text{ feet} \end{aligned}$$

Practice Time 3B

- (a) In the given figure 6 out of 10 parts are shaded.
So, six-tenths of the figure is shaded.
 - (b) In the given figure 2 out of 10 parts are shaded.
So, two-tenths of the figure is shaded.
 - (c) In the given figure 5 out of 10 parts are shaded.
So, five-tenths of the figure is shaded.
- In 1.5327, the digit in the hundredths place is 3.
 - In 354.168
Tenths place digit = 1
Hundredths place digit = 6
Sum = 1 + 6 = 7
 - Decimal form: 243.25
Fraction form: $243\frac{2}{10}\frac{5}{100} = 243\frac{1}{4}$

5. In 85.275, the digit 7 is in the hundredths place.
 Place value of 7 = seven hundredths = 0.07
6. The tenths place is the first digit after the decimal point. In 43.87, the digit in the tenths place is 8.
7. (a) 124.123 → One hundred twenty-four and one hundred twenty-three thousandths.
 (b) 12.3214 → Twelve and three thousand two hundred fourteen ten-thousandths.
 (c) 0.363 → Zero and three hundred sixty-three thousandths.
 (d) 0.002 → Zero and two thousandths.
 (e) 34.578 → Thirty-four and five hundred seventy-eight thousandths.
 (f) 231.0258 → Two hundred thirty-one and two hundred fifty-eight ten-thousandths.
 (g) 1.025 → One and twenty-five thousandths.
 (h) 12.0034 → Twelve and thirty-four ten-thousandths.
 (i) 2.0001 → Two and one ten-thousandth.
 (j) 112.021 → One hundred twelve and twenty-one thousandths.

8. (a) 13,000 (b) 20.06
 (c) 235.060 (d) 3022.0004
 (e) 1000.3 (f) 6.7
 (g) 420.008 (h) 75.030
 (i) 4.071



10. (a) $234.5678 = 2 \times 100 + 3 \times 10 + 4$
 $+ \frac{5}{10} + \frac{6}{100} + \frac{7}{1000} + \frac{8}{10000}$
- (b) $45.609 = 4 \times 10 + 5 + \frac{6}{10} + \frac{9}{1000}$
- (c) $0.0034 = \frac{3}{1000} + \frac{4}{10000}$

(d) $91.0286 = 9 \times 10 + 1 + \frac{2}{100} + \frac{8}{1000} + \frac{6}{10000}$

(e) $798.3401 = 7 \times 100 + 9 \times 10 + 8$
 $+ \frac{3}{10} + \frac{4}{100} + \frac{1}{10000}$

We can write the given numbers in a place value chart as follows:

| | Hundreds (100) | Tens (10) | Ones (1) | Point (.) | Tenths $\frac{1}{10}$ | Hundredths $\frac{1}{100}$ | Thousandths $\frac{1}{1000}$ | Ten thousandths $\frac{1}{10000}$ |
|-----|-------------------|--------------|-------------|--------------|--------------------------|-------------------------------|---------------------------------|---|
| (a) | 2 | 3 | 4 | . | 5 | 6 | 7 | 8 |
| (b) | | 4 | 5 | . | 6 | 0 | 9 | |
| (c) | | | 0 | . | 0 | 0 | 3 | 4 |
| (d) | | 9 | 1 | . | 0 | 2 | 8 | 6 |
| (e) | 7 | 9 | 8 | . | 3 | 4 | 0 | 1 |

11. (a) 2 ones, 3 tenths and 4 thousandths → 2.304
 (b) 8 hundredths and 9 tenths → 0.98
 (c) 4 ones and 6 thousandths → 4.006
 (d) 7 hundreds 8 tens 4 ones and 5 tenths and 7 hundredths → 784.57

(e) $\frac{5}{100} \rightarrow 0.05$ (f) $3\frac{4}{10}\frac{5}{1000} \rightarrow 3.405$

(g) $7\frac{7}{1000} \rightarrow 7.007$

These numbers can be written in the place value chart as

| | Hundreds (100) | Tens (10) | Ones (1) | Point (.) | Tenths $\frac{1}{10}$ | Hundredths $\frac{1}{100}$ | Thousandths $\frac{1}{1000}$ |
|-----|-------------------|--------------|-------------|--------------|--------------------------|-------------------------------|---------------------------------|
| (a) | | | 2 | . | 3 | 0 | 4 |
| (b) | | | 0 | . | 9 | 8 | |
| (c) | | | 4 | . | 0 | 0 | 6 |
| (d) | 7 | 8 | 4 | . | 5 | 7 | |
| (e) | | | 0 | . | 0 | 5 | |
| (f) | | | 3 | . | 4 | 0 | 5 |
| (g) | | | 7 | . | 0 | 0 | 7 |

Think Tank (Page 67)

Cost of cake = ₹850.50
 Cost of balloons = ₹75.75
 Cost of snacks = ₹500.00
 Cost of return gifts = ₹675.25
 Total money spent = 850.50 + 75.75 + 500.00 + 675.25 = ₹2101.50
 Money given by father = ₹4000.00
 Money left = 4000.00 – 2101.50 = ₹1898.50
 Therefore, ₹1898.50 is left with Swastik.

Practice Time 3C

- 38 out of 100 equal parts of the figure are shaded. Therefore, the shaded portion of the figure is represented by the decimal 0.38.
 - 42 out of 100 equal parts of the figure are shaded. Therefore, the shaded portion of the figure is represented by the decimal 0.42.
 - 26 out of 100 equal parts of the figure are shaded. Therefore, the shaded portion of the figure is represented by the decimal 0.26.
- To compare decimals, we first make the number of decimal places equal and then compare digit by digit from left to right.
 - 0.27 and 0.32
Writing both numbers with two decimal places, we compare 27 hundredths and 32 hundredths. Since 32 hundredths is greater than 27 hundredths, $0.27 < 0.32$.
 - 1.432 and 1.342
The whole number part is the same. Comparing the decimal part, 432 thousandths is greater than 342 thousandths. Hence, $1.432 > 1.342$.
 - 5.69 and 5.069
Write 5.69 as 5.690. Now compare 690 thousandths with 69 thousandths. Since 690 thousandths is greater, $5.69 > 5.069$.
 - 2.32 and 2.3
Write 2.3 as 2.30. Since 32 hundredths is greater than 30 hundredths, $2.32 > 2.3$.
 - 1.003 and 1.030
Compare 3 thousandths and 30 thousandths. Since 30 thousandths is greater, $1.003 < 1.030$.
 - 0.42 and 0.042
Write 0.42 as 0.420. Now 420 thousandths is greater than 42 thousandths. Hence, $0.42 > 0.042$.
- We know that $1 \text{ m} = 100 \text{ cm}$ and $1 \text{ m} = 1000 \text{ mm}$. Also, $1 \text{ km} = 1000 \text{ m}$.
 - To convert 60 millimetres to metres, divide it by 1000.
$$60 \div 1000 = 0.06 \text{ m}$$

- To convert 4 centimetres to metres, divide it by 100.

$$4 \div 100 = 0.04 \text{ m}$$

- To convert 45 kilometres to metres, multiply it by 1000.

$$45 \times 1000 = 45000 \text{ m}$$

- $164 \div 1000 = 0.164 \text{ m}$

- We know that $1 \text{ km} = 1000 \text{ m}$

$$1 \text{ km} = 100000 \text{ cm.}$$

- $4329 \text{ m} = (4329 \div 1000) \text{ km} = 4.329 \text{ km}$

- $34 \text{ cm} = (34 \div 100000) \text{ km} = 0.00034 \text{ km}$

- $8802 \text{ m} = (8802 \div 1000) \text{ km} = 8.802 \text{ km}$

- $2025 \text{ cm} = (2025 \div 100000) \text{ km} = 0.02025 \text{ km}$

- We know that $1 \text{ kg} = 1000 \text{ g}$.

- $750 \text{ g} = (750 \div 1000) \text{ kg} = 0.75 \text{ kg}$

- $80 \text{ g} = (80 \div 1000) \text{ kg} = 0.08 \text{ kg}$

$$\text{So, } 4 \text{ kg } 80 \text{ g} = (4 + 0.08) \text{ kg} = 4.08 \text{ kg}$$

- $9 \text{ g} = (9 \div 1000) = 0.009 \text{ kg}$

$$\text{So, } 2 \text{ kg } 9 \text{ g} = (2 + 0.009) \text{ kg} = 2.009 \text{ kg}$$

- $1298 \text{ g} = (1298 \div 1000) \text{ kg} = 1.298 \text{ kg}$

- Since $100 \text{ paise} = ₹1$, we divide the number of paise by 100.

- $725 \text{ paise} = ₹(725 \div 100) = ₹7.25$

- $359 \text{ paise} = ₹(359 \div 100) = ₹3.59$

- $30 \text{ paise} = ₹(30 \div 100) = ₹0.30$

- $5 \text{ paise} = ₹(5 \div 100) = ₹0.05$

-

$$\begin{array}{r} 25.62 \\ + 3.06 \\ \hline 28.68 \end{array}$$

$$\begin{array}{r} 312.045 \\ + 3.333 \\ \hline 327.810 \end{array}$$

$$\begin{array}{r} 280.34 \\ + 452.45 \\ \hline 4804.84 \end{array}$$

$$\begin{array}{r} 0.600 \\ + 0.340 \\ + 0.003 \\ + 0.034 \\ \hline 0.977 \end{array}$$

$$\begin{array}{r} 0.2 \\ + 2.02 \\ + 3.1 \\ \hline 7.32 \end{array}$$



$$\begin{array}{r} (f) \quad 3 \ 4 \ . \ 2 \ 0 \ 0 \ 0 \\ \quad \quad 3 \ . \ 2 \ 2 \ 2 \ 0 \\ \quad \quad 2 \ . \ 0 \ 1 \ 0 \ 2 \\ + \quad \quad 4 \ . \ 1 \ 0 \ 0 \ 0 \\ \hline \quad \quad 4 \ 3 \ . \ 5 \ 3 \ 2 \ 2 \end{array}$$

8. (a) $4 \text{ kg } 900 \text{ g} - 2 \text{ kg } 60 \text{ g}$
 $= (4 - 2) \text{ kg } (900 - 60) \text{ g}$
 $= 2 \text{ kg } 840 \text{ g}$

$$\begin{array}{r} \text{kg} \quad \text{g} \\ 4 \quad 9 \ 0 \ 0 \\ - \quad 2 \quad 6 \ 0 \\ \hline 2 \quad 8 \ 4 \ 0 \end{array}$$

(b) $₹54.09 - ₹34.6 = ₹19.49$

$$\begin{array}{r} ₹ \quad 5 \ 4 \ . \ 0 \ 9 \\ - ₹ \quad 3 \ 4 \ . \ 6 \ 0 \\ \hline ₹ \quad 1 \ 9 \ . \ 4 \ 9 \end{array}$$

(c)
$$\begin{array}{r} 4 \ . \ 2 \ 8 \ \text{km} \\ - 1 \ . \ 0 \ 7 \ \text{km} \\ \hline 3 \ . \ 2 \ 1 \ \text{km} \end{array}$$

(d)
$$\begin{array}{r} 3 \ 1 \ . \ 0 \ 2 \\ - \quad 4 \ . \ 7 \ 6 \\ \hline 2 \ 6 \ . \ 2 \ 6 \end{array}$$

(e)
$$\begin{array}{r} 2 \ . \ 1 \ 0 \ 7 \ \text{kg} \\ - 0 \ . \ 3 \ 1 \ 4 \ \text{kg} \\ \hline 1 \ . \ 7 \ 9 \ 3 \ \text{kg} \end{array}$$

(f)
$$\begin{array}{r} 2 \ 0 \ 2 \quad \text{m} \\ - 2 \ 0 \ 2 \ . \ 4 \ 5 \ \text{m} \\ \hline 4 \ 7 \ . \ 5 \ 5 \ \text{m} \end{array}$$

9. Abhishek had ₹812.58.

Money spent on fruits = ₹109.25

Money spent on grocery = ₹314.55

Total spent = $109.25 + 314.55 = ₹423.80$

Money left = $812.58 - 423.80 = ₹388.78$

10. Total distance travelled by Namita = $20 \text{ km } 50 \text{ m}$
 $= 20.050 \text{ km}$

Distance travelled by bus = $10 \text{ km } 200 \text{ m}$
 $= 10.200 \text{ km}$

Distance travelled by auto = $20.050 - 10.200$
 $= 9.850 \text{ km or } 9 \text{ km } 850 \text{ m}$

11. Apples = $4 \text{ kg } 900 \text{ g} = 4.900 \text{ kg}$

Grapes = $2 \text{ kg } 650 \text{ g} = 2.650 \text{ kg}$

Mangoes = $5 \text{ kg } 325 \text{ g} = 5.325 \text{ kg}$

Total weight = $4.900 + 2.650 + 5.325 = 12.875 \text{ kg}$
 or $12 \text{ kg } 875 \text{ g}$

12. (a) Each term increases by 0.25.

$3.75 + 0.25 = 4.00$, $4.00 + 0.25 = 4.25$,

$4.25 + 0.25 = 4.50$

So, the next three terms are 4.00, 4.25, 4.50,

(b) Each term increases by 0.2.

$9.3 + 0.2 = 9.5$, $9.5 + 0.2 = 9.7$, $9.7 + 0.2 = 9.9$
 So, the next three terms are 9.5, 9.7, 9.9.

(c) Each term increases by 1.5.

$15.5 + 1.5 = 17$, $17 + 1.5 = 18.5$, $18.5 + 1.5 = 20$
 So, the next three terms are 17, 18.5, 20.

(d) Each term increases by 0.08.

$1.53 + 0.08 = 1.61$, $1.61 + 0.08 = 1.69$,
 $1.69 + 0.08 = 1.77$

So, the next three terms are 1.61, 1.69, 1.77.

Chapter Assessment

A. 1. $\frac{18}{1000} = 0.018$

Therefore, the correct option is (b).

2. Each term increases by 0.05. So, the next term of the sequence is

$$5.20 + 0.05 = 5.25$$

Therefore, the correct option is (d)

3. Converting all the given fractions into thousandths, we get

$$\frac{3}{10} \rightarrow \frac{300}{1000}, \quad \frac{3}{100} \rightarrow \frac{30}{1000}, \quad \frac{33}{100} \rightarrow \frac{330}{1000},$$

$$\frac{333}{1000} \rightarrow \frac{333}{1000}$$

Since $30 < 300 < 330 < 333$, the smallest number among the given numbers is $\frac{3}{100}$.

Therefore, the correct option is (b).

4. $15 + \frac{3}{10} + \frac{4}{100} + \frac{6}{10} + \frac{8}{100} + 2$

$$= (15 + 2) + \left(\frac{3}{10} + \frac{6}{10}\right) + \left(\frac{4}{100} + \frac{8}{100}\right)$$

$$= 17 + \frac{9}{10} + \frac{12}{100} = 17 + \frac{10}{10} + \frac{2}{100} = 18 \frac{2}{100}$$

Therefore, the correct answer is option (b).

5. $3.56 - 1.1 = 2.46$

$$3.58 - 1.1 = 2.48$$

$$3.088 - 1.1 = 1.988$$

$$3.099 - 1.1 = 1.999$$

The smallest difference is 1.988.

Therefore, the correct answer is option (c).

B. 1. $0.58 = 0.580$

So, both numbers are equal, not greater. Hence, the assertion is false. The reason is true because adding zeros to the right does not change the value. Hence, the correct option is (d).

2. $0.250 > 0.245$

So, assertion (A) is true. The reason is also true and correctly explains how we compare the decimals.

Hence, the correct option is (a).

C. 1. **F:** Tenths place value = digit $\times \frac{1}{10}$,

Ones place value = digit $\times 1$

Tenths place value is 10 times smaller, not bigger.

2. **F:** $3.725 \approx 3.73$

3. **T:** $42.28 - 3.19 = 39.09$

4. **F:** $19.250 > 19.053$

5. **F:** In 12.375, 7 is in the hundredths place (0.07), not tenths.

D. 1. (a) Find the difference between terms.

$$1.7 - 0.95 = 0.75$$

$$2.45 - 1.7 = 0.75$$

$$3.2 - 2.45 = 0.75$$

Each term increases by 0.75. So, the next three terms are:

$$3.2 + 0.75 = 3.95$$

$$3.95 + 0.75 = 4.70$$

$$4.70 + 0.75 = 5.45$$

Answer: 3.95, 4.70, 5.45

(b) 8.5, 9.4, 10.3, ...

Difference:

$$9.4 - 8.5 = 0.9$$

$$10.3 - 9.4 = 0.9$$

Add 0.9 each time:

$$10.3 + 0.9 = 11.2$$

$$11.2 + 0.9 = 12.1$$

$$12.1 + 0.9 = 13.0$$

Answer: 11.2, 12.1, 13.0

(c) 3.5, 3.7, 3.9, 4.1, ...

Difference:

$$3.7 - 3.5 = 0.2$$

$$3.9 - 3.7 = 0.2$$

$$4.1 - 3.9 = 0.2$$

Add 0.2 each time:

$$4.1 + 0.2 = 4.3$$

$$4.3 + 0.2 = 4.5$$

$$4.5 + 0.2 = 4.7$$

Answer: 4.3, 4.5, 4.7

(d) 2.72, 3.74, 4.76, 5.78, ...

Difference:

$$3.74 - 2.72 = 1.02$$

$$4.76 - 3.74 = 1.02$$

$$5.78 - 4.76 = 1.02$$

Add 1.02 each time:

$$5.78 + 1.02 = 6.80$$

$$6.80 + 1.02 = 7.82$$

$$7.82 + 1.02 = 8.84$$

Answer: 6.80, 7.82, 8.84

2. (a) $2.478 = 2 + 0.4 + 0.07 + 0.008$

$$= 2 + \frac{4}{10} + \frac{7}{100} + \frac{8}{1000}$$

(b) $0.368 = 0.3 + 0.06 + 0.008$

$$= \frac{3}{10} + \frac{6}{100} + \frac{8}{1000}$$

(c) $0.008 = 0.008 = \frac{8}{1000}$

(d) $1.028 = 1 + 0.02 + 0.008 = 1 + \frac{2}{100} + \frac{8}{1000}$

(e) $2.391 = 2 + 0.3 + 0.09 + 0.001$

$$= 2 + \frac{3}{10} + \frac{9}{100} + \frac{1}{1000}$$

3. (a) $0.153 < 0.468 < 0.721 < 0.895 < 0.926$

Therefore, the correct ascending order is:
0.153, 0.468, 0.721, 0.895, 0.926

(b) $2.459 < 2.567 < 2.678 < 2.689 < 2.768$

Therefore, the correct ascending order is:
2.459, 2.567, 2.678, 2.689, 2.768

(c) $0.259 < 2.540 < 3.050 < 5.640 < 8.320$

Therefore, the correct ascending order is:
0.259, 2.54, 3.05, 5.64, 8.32

(d) $0.205 < 0.863 < 3.810 < 5.960 < 6.400 < 8.140$

Therefore, the correct ascending order is:
0.205, 0.863, 3.81, 5.96, 6.4, 8.14

(e) $0.0009 < 0.9300 < 0.9600 < 6.0100$

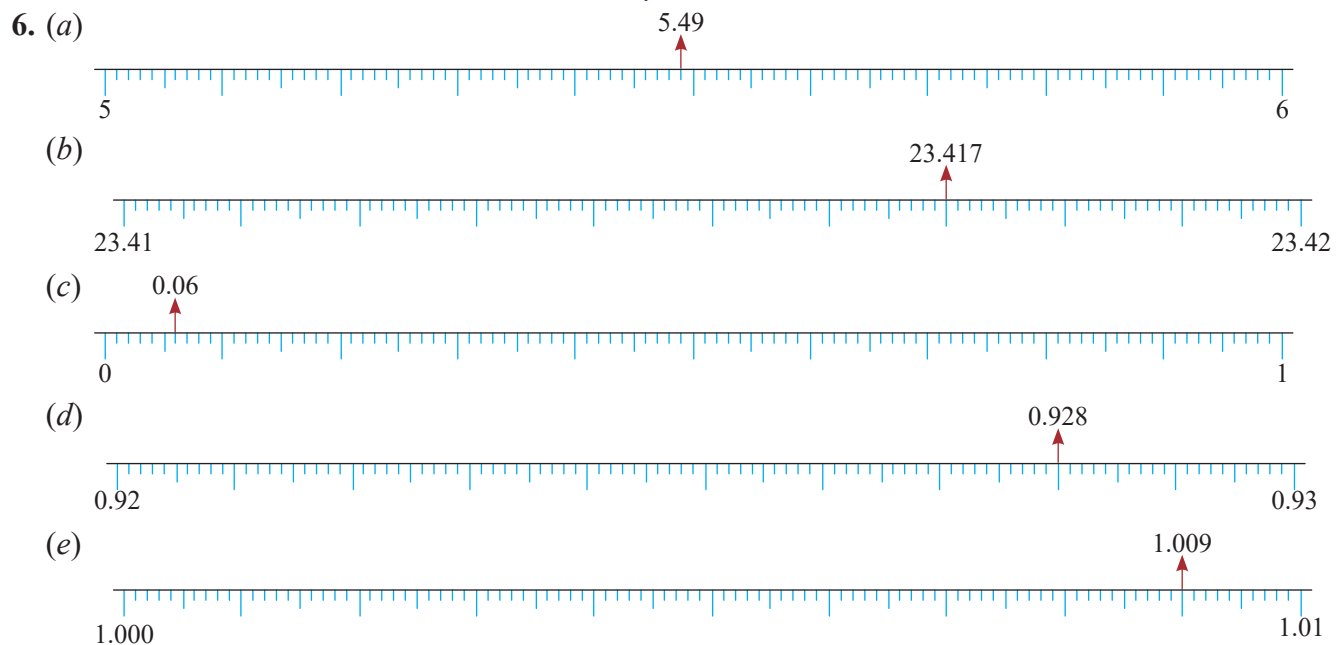
Therefore, the correct ascending order is:
0.0009, 0.93, 0.96, 6.01

4. (a) $3.459 = 3 + \frac{4}{10} + \frac{5}{100} + \frac{9}{1000}$
 (b) $234.679 = 2 \times 100 + 3 \times 10 + 4 + \frac{6}{10} + \frac{7}{100} + \frac{9}{1000}$
 (c) $108.9801 = 1 \times 100 + 8 + \frac{9}{10} + \frac{8}{100} + \frac{1}{10000}$
 (d) $0.2089 = \frac{2}{10} + \frac{8}{1000} + \frac{9}{10000}$
 (e) $34.981 = 3 \times 10 + 4 + \frac{9}{10} + \frac{8}{100} + \frac{1}{1000}$

Using these expanded forms, we can write the given numbers in the place value chart as follows:

| | Hundreds (100) | Tens (10) | Ones (1) | Point (.) | Tenths $\frac{1}{10}$ | Hundredths $\frac{1}{100}$ | Thousandths $\frac{1}{1000}$ | Ten thousandths $\frac{1}{10000}$ |
|-----|-------------------|--------------|-------------|--------------|--------------------------|-------------------------------|---------------------------------|---|
| (a) | | | 3 | . | 4 | 5 | 9 | |
| (b) | 2 | 3 | 4 | . | 6 | 7 | 9 | |
| (c) | 1 | 0 | 8 | . | 9 | 8 | 0 | 1 |
| (d) | | | 0 | . | 2 | 0 | 8 | 9 |
| (e) | | 3 | 4 | . | 9 | 8 | 1 | |

5. (a) $34 + \frac{0}{10} + \frac{2}{100} + \frac{5}{1000}$
 $= 34 + 0.0 + 0.02 + 0.005 = 34.025$
 (b) $291 + \frac{3}{10} + \frac{8}{100000}$
 $= 291 + 0.3 + 0.00008 = 291.30008$
 (c) $\frac{4}{100} + \frac{5}{10} + \frac{9}{1000}$
 $= 0.04 + 0.5 + 0.009 = 0.549$
 (d) $23 + \frac{7}{100} + \frac{2}{1000}$
 $= 23 + 0.07 + 0.002 = 23.072$
 (e) $19 + \frac{3}{1000} + \frac{7}{10} + \frac{8}{10}$
 $= 19 + 0.003 + 0.7 + 0.8$
 $= 19 + 1 + 0.5 + 0.003 = 20.503$
 (f) $300 + 20 + 8\frac{5}{10} + \frac{7}{100}$
 $= 328 + 0.05 + 0.07 = 328.57$



7. (a) The length between 5 and 5.4 has been divided into 40 equal parts. So, each small division represents 0.01.
 Therefore, A = 5.09, B = 5.13, C = 5.2,

D = 5.31
 (b) The length between 5 and 10 has been divided into 10 equal parts. So, each small division represents 0.5.

Therefore, $A = 6$, $B = 7.5$, $C = 9.5$

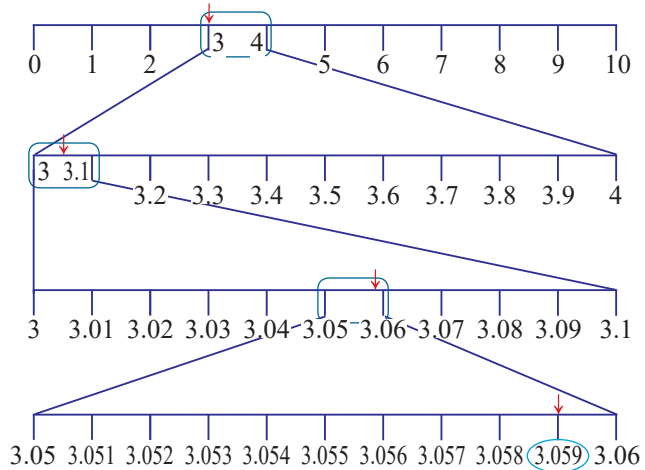
(c) The length between 8 and 8.1 has been divided into 10 equal parts. So, each small division represents 0.01.

Therefore, $A = 8.02$, $B = 8.06$.

(d) The length between 4.3 and 4.8 has been divided into 10 equal parts. So, each small division represents 0.05.

Therefore, $A = 4.35$, $B = 4.5$, $C = 4.85$.

8. We can label the numbers on the given diagram as follows:



Therefore, the number represented by the question mark (?) is 3.059.

9. (a) $20.62 + 13.01 = 33.63$
 (b) $₹115.35 + ₹19.27 = ₹134.62$
 (c) $₹172.12 + ₹4201.89 = ₹4374.01$
 (d) $₹96.45 + ₹128.31 + ₹104.72 = ₹329.48$
 (e) $₹359.28 - ₹140.20 = ₹219.08$
10. (a) $0.8 = 0.80$, $0.9 = 0.90$
 Since 90 hundredths $>$ 80 hundredths,
 The greater number is 0.9.
- (b) 1.23 and 1.08
 Compare digits after the decimal point from left to right: $2 > 0$. So, $1.23 > 1.08$.
 The greater number is 1.23.
- (c) $0.5 = 0.50$
 $0.50 > 0.05$
 The greater number is 0.5.
- (d) Compare thousandths: $1.431 < 1.490$
 The greater number is 1.490.

- (e) $5.64 = 5.640$
 $5.640 < 5.672$
 The greater number is 5.672
- (f) $3.3 = 3.30$
 $3.30 < 3.33$
 The greater number is 3.33.

11. Convert 2009 paise to rupees

$$100 \text{ paise} = ₹1$$

$$2009 \text{ paise} = ₹ \frac{2009}{100}$$

$$\frac{2009}{100} = \frac{2000}{100} + \frac{9}{100}$$

$$= 20 + \frac{9}{100} = ₹20 \frac{9}{100}$$

12. Convert 1537 cm to m

$$100 \text{ cm} = 1 \text{ m}$$

$$1537 \text{ cm} = \frac{1537}{100} \text{ m}$$

13. (a) 9.3, 10.2, 11.1

Each term increases by 0.9.

Next terms:

$$11.1 + 0.9 = 12.0$$

$$12.0 + 0.9 = 12.9$$

$$12.9 + 0.9 = 13.8$$

(b) 5, 4.95, 4.90

Each term decreases by 0.05.

Next terms:

$$4.90 - 0.05 = 4.85$$

$$4.85 - 0.05 = 4.80$$

$$4.80 - 0.05 = 4.75$$

(c) 12.45, 11.95, 11.45

Each term decreases by 0.50.

Next terms:

$$11.45 - 0.50 = 10.95$$

$$10.95 - 0.50 = 10.45$$

$$10.45 - 0.50 = 9.95$$

(d) 36.5, 33, 29.5

Each term decreases by 3.5.

Next terms:

$$29.5 - 3.5 = 26.0$$

$$26.0 - 3.5 = 22.5$$

$$22.5 - 3.5 = 19.0$$

14. Distance walked in the morning = 2 km 35 m
 Distance walked in the evening = 1 km 7 m
 Total distance walked = 2 km 35 m + 1 km 7 m = (2 + 1) km (35 + 7) m = 3 km 42 m
15. Rice = 5 kg 400 g
 Sugar = 2 kg 20 g
 Flour = 10 kg 850 g
 Add grams:
 $400 + 20 + 850 = 1270 \text{ g} = 1 \text{ kg } 270 \text{ g}$
 Add kilograms:
 $5 + 2 + 10 = 17 \text{ kg}$
 Total weight = 1 kg 270 g + 17 kg = 18 kg 270 g
16. $54 + 46.8 + 23.25$
 $54 + 46.8 = 100.8$
 $100.8 + 23.25 = 124.05$
 So, the total distance covered = 124.05 km
17. Apples = 2 kg 280 g
 Guavas = 3 kg 375 g
 Grapes = 525 g
 Oranges = 5 kg 385 g
 Add grams: $280 + 375 + 525 + 385 = 1565 \text{ g} = 1 \text{ kg } 565 \text{ g}$
 Add kilograms: $2 + 3 + 5 = 10 \text{ kg}$
 Total weight = 10 kg + 1 kg 565 g = 11 kg 565 g
18. Length of remaining wooden board
 $= 150\frac{1}{4} - 40\frac{1}{5} = (150 - 140) + \left(\frac{1}{4} - \frac{1}{5}\right)$
 $= (10) + \left(\frac{1}{20}\right) = 10\frac{1}{20} \text{ cm}$
19. Try placing digits near 25:
 25.148 uses digits 2, 5, 4, 1, 8 (each once). This is very close to 25.
20. $0.643 + 9.857 = 10.5$

| | | | | | |
|---|---|---|---|---|---|
| | 9 | . | 8 | 5 | 7 |
| + | 0 | . | 6 | 4 | 3 |
| | | | | | |
| | 1 | . | 5 | 0 | 0 |

Challenge Question (Page 73)

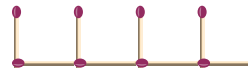
The required number is 62.38.
 As it is a 4-digit number, less than 100, having only one odd digit (3), the hundredths digit is the sum of

the tens and ones digits ($8 = 2 + 6$), the tens digit is three times the ones digit ($6 = 3 \times 2$), the tens digit is two times the tenths digit ($6 = 2 \times 3$).

CHAPTER 4: EXPRESSIONS USING LETTER-NUMBERS

Let's Recall

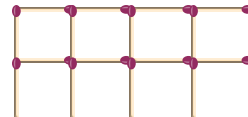
1. (a) Each new figure adds one vertical matchstick and one horizontal matchstick to the right side. So, the next shape in the pattern is



- (b) Each new figure adds one to the previous



figure. So, the next shape in the pattern is



2. (a) $23 - 10 \times 2 = 23 - 20 = 3$
 (b) $83 + 17 - 24 \times 2 = 83 + 17 - 48 = 100 - 48 = 52$
 (c) $2 + 2 - 2 \times 2 \div 2 = 2 + 2 - 2 \times 1 = 2 + 2 - 2 = 4 - 2 = 2$
 (d) $42 + 15 - (12 - 7) \times 2 = 42 + 15 - 5 \times 2 = 57 - 10 = 47$
 (e) $12 + (23 - 47) \times 2 + 86 = 12 + (-24) \times 2 + 86 = 12 - 48 + 86 = -36 + 86 = 50$
 (f) $7 \times 4 + 23 - 15 \div 3 = 28 + 23 - 5 = 51 - 5 = 46$

Fast Check (Page 80)

Double of $p = 2p$
 Sum of x and $2p = x + 2p$
 13 less than this sum means subtract 13: $(x + 2p) - 13$
 Therefore, the given statement can be represented mathematically as: $(x + 2p) - 13$.

Practice Time 4A

1. In a calendar, dates decrease by 1 when we move left, and decrease by 7 when we move up. The last date given is 20, and it is taken as t . Moving left from t , subtract 1 each time (bottom

row): $t - 3, t - 2, t - 1, t$

Moving up from any date subtract 7(Top row):

$t - 10, t - 9, t - 8, t - 7$

Therefore, we have

| | | | |
|----------|---------|---------|---------|
| $t - 10$ | $t - 9$ | $t - 8$ | $t - 7$ |
| $t - 3$ | $t - 2$ | $t - 1$ | t |

Sum of all dates: $(t - 10) + (t - 9) + (t - 8) + (t - 7) + (t - 3) + (t - 2) + (t - 1) + t = 8t - 40$

Therefore, the expression for sum of all dates is: $8t - 40$.

2. One pentagon uses 5 matchsticks. Each new pentagon shares one side, so it adds 4 matchsticks.

Therefore, the number of matchsticks for:

1 pentagon $\rightarrow 5 = 4 + 1$;

2 pentagons $\rightarrow (4 + 1) + 4 = 4 \times 2 + 1$;

3 pentagons $\rightarrow (4 \times 2 + 1) + 4 = 4 \times 3 + 1, \dots$

In the same pattern,

For n pentagons $\rightarrow 4n + 1$

3. Perimeter of a square = $4 \times$ side

$$\text{Side} = p$$

So, the expression for perimeter = $4p$

If side = 7 cm, then $4 \times 7 = 28$ cm

Therefore, Perimeter = 28 cm

4. (a) 7 added to $p \rightarrow p + 7$
 (b) 7 subtracted from $q \rightarrow q - 7$
 (c) p multiplied by 6 $\rightarrow 6p$
 (d) s divided by 9 $\rightarrow \frac{s}{9}$
 (e) 7 subtracted from $-p \rightarrow -p - 7$
 (f) n multiplied by $-t \rightarrow -nt$
 (g) 11 added to twice of $n \rightarrow 2n + 11$
 (h) 3 is subtracted from 5 times $y \rightarrow 5y - 3$
5. (a) $8p + 11q \rightarrow$ Cost of 8 items priced p each and 11 items priced q each.
 (b) $12q - 10r \rightarrow$ Total amount after earning q rupees for 12 days and spending r rupees for 10 days.
 (c) $10y + 11 \rightarrow$ Cost of 10 items priced y each with an extra charge of 11 rupees.
 (d) $s^3 + 9 \rightarrow$ Volume of a cube of side s units increased by 9 cubic units.
 (Answer may vary)
6. (a) 3 times y added to 13 $\rightarrow 3y + 13 \rightarrow (iv)$
 (b) 8 subtracted from 5 times $y \rightarrow 5y - 8 \rightarrow (i)$

(c) 5 reduced from 3 times $x \rightarrow 3x - 5 \rightarrow (ii)$

(d) 5 added to double of $x \rightarrow 2x + 5 \rightarrow (iii)$

7. (a) **True:** $6x \div 3$ is an algebraic expression.

(b) **False:** 5 times x subtracted from 8 times y is $8y - 5x$

(c) **False:** A number having a fixed value is called a constant, not a variable.

8. Dots in one row = 9

Number of rows = r

Total dots in r rows = $9r$

(a) For 10 rows $\rightarrow 9 \times 10 = 90$ dots

(b) For 12 rows $\rightarrow 9 \times 12 = 108$ dots

(c) For 20 rows $\rightarrow 9 \times 20 = 180$ dots

9. Oranges in one small box = p

Two small boxes = $2p$

10 oranges remain outside.

Total oranges in large box = $2p + 10$

10. Given total laddoos = p

Laddoos given away to neighbours = $5 \times 10 = 50$

Laddoos given to family (3 members) = $3 \times 3 = 9$

Laddoos eaten by mother = 2

Total laddoos used = $50 + 9 + 2 = 61$

Remaining laddoos = $p - 61$

11. Time travelled from 6:00 a.m. to 12:00 noon = 6 hours

Speed = x km/h

Distance travelled from 6:00 a.m. to 12:00 noon

$$= \text{Time} \times \text{Speed} = 6x \text{ km}$$

Still 50 km left. So, Total distance = $6x + 50$

12. Sanskrit marks = x

Two-thirds of Sanskrit marks = $\frac{2}{3}x$

Science marks = 15 more than $\frac{2}{3}x$, that is $\frac{2}{3}x + 15$

Required expression: $\frac{2}{3}x + 15$

Practice Time 4B

1. (a) $3x + 2(3x - 2) + 10 = 3x + 6x - 4 + 10$

$$= 9x + 6$$

- (b) $2x + 5(y - 2) + 15 = 2x + 5y - 10 + 15$

$$= 2x + 5y + 5$$

- (c) $3(3a - 8b) - 8a - 4b + 16$

$$= 9a - 24b - 8a - 4b + 16$$

$$= a - 28b + 16$$



$$\begin{aligned}(d) \quad & 23 + 5(6m + 3n - 2p) + 8n - 13m + 12 \\ & = 23 + 30m + 15n - 10p + 8n - 13m + 12 \\ & = 17m + 23n - 10p + 35\end{aligned}$$

$$\begin{aligned}(e) \quad & 4(x + 2y) - 3(y + 2x) = 4x + 8y - 3y - 6x \\ & = -2x + 5y\end{aligned}$$

2. Length of the rectangle = $2x + 3$

Width of the rectangle = $x - 2$

Perimeter of a rectangle = $2(\text{Length} + \text{Width})$

$$\begin{aligned}\text{Therefore, perimeter} &= 2[(2x + 3) + (x - 2)] \\ &= 2(3x + 1) \\ &= 6x + 2\end{aligned}$$

For $x = 1$: Perimeter = $6(1) + 2 = 8$ units.

3. Steve = x years

Rachel = $(11 + x)$ years

Barry = $2(11 + x)$ years

$$\begin{aligned}\text{Total age} &= x + (11 + x) + 2(11 + x) \\ &= 2x + 11 + 22 + 2x = 4x + 33\end{aligned}$$

Expression: $(4x + 33)$ years

4. (a) Time taken to travel between two stations = t minutes

Stopping time at each station = 5 minutes

The journey has 4 travel parts (A \rightarrow Station 1 \rightarrow Station 2 \rightarrow Station 3 \rightarrow B).

Therefore, total traveling time = $4t$

Total stopping time = $3 \times 5 = 15$ minutes

Total time from A to B = $4t + 15$

(b) When $t = 6$:

$$\begin{aligned}\text{Total time taken} &= 4(6) + 15 = 24 + 15 \\ &= 39 \text{ minutes}\end{aligned}$$

5. For $n = 2$:

$$(a) \quad 5n + 3 = 5(2) + 3 = 10 + 3 = 13$$

$$\begin{aligned}(b) \quad & 4n - \frac{3}{4} = 4(2) - \frac{3}{4} \\ & = 8 - \frac{3}{4} = \frac{29}{4} = 7\frac{1}{4}\end{aligned}$$

$$\begin{aligned}(c) \quad & 100 - 10n = 100 - 10(2) \\ & = 100 - 20 = 80\end{aligned}$$

6. In the given figure, the length of the unknown horizontal side = $(2x + 6) - (x + 1)$

$$= 2x + 6 - x - 1 = x + 5$$

The length of the unknown vertical side

$$= (x + 5) - (x + 2) = x + 5 - x - 2 = 3$$

Perimeter of the given figure = Sum of the lengths of the given sides

$$\begin{aligned}& = (x + 1) + (x + 5) + (2x + 6) + (x + 2) + (x + 5) + 3 \\ & = 6x + 22\end{aligned}$$

For $x = 3$:

$$\text{Perimeter} = 6(3) + 22 = 18 + 22 = 40 \text{ units.}$$

7. For $a = 3, b = 2, c = -1$:

$$\begin{aligned}(a) \quad & a + 2b - 3c = 3 + 2(2) - 3(-1) \\ & = 3 + 4 + 3 = 10\end{aligned}$$

$$\begin{aligned}(b) \quad & \frac{1}{4}a + \frac{2}{3}b - \frac{1}{8}c = \frac{1}{4}(3) + \frac{2}{3}(2) - \frac{1}{8}(-1) \\ & = \frac{3}{4} + \frac{4}{3} + \frac{1}{8} \\ & = \frac{18}{24} + \frac{32}{24} + \frac{3}{24} \\ & \quad \text{(Since LCM of 4, 3, 8 = 24)} \\ & = \frac{53}{24}\end{aligned}$$

$$\begin{aligned}(c) \quad & 7a - 4b + 2c = 7(3) - 4(2) + 2(-1) \\ & = 21 - 8 - 2 = 11\end{aligned}$$

$$\begin{aligned}8. (a) \quad & x + 7 + 4(x - 5) = x + 7 + 4x - 20 \\ & = 5x - 13\end{aligned}$$

For $x = 2$:

$$5x - 13 = 5(2) - 13 = 10 - 13 = -3$$

$$(b) \quad 6x + 5(x - 2) = 6x + 5x - 10 = 11x - 10$$

For $x = 2$:

$$11x - 10 = 11(2) - 10 = 22 - 10 = 12$$

$$\begin{aligned}(c) \quad & 4(2x - 1) + 3x + 11 = 8x - 4 + 3x + 11 \\ & = 11x + 7\end{aligned}$$

For $x = 2$:

$$11x + 7 = 11(2) + 7 = 22 + 7 = 29$$

9. (a) $4p$ and $5q$ are repeated 4 times each,

(-4) and 5 are repeated 2 times each. We can add them as

Terms in squares: $-4, 5, 5, -4$. We can add them in different ways as:

$$\begin{aligned}4(4p) + 4(5q) - 4 - 4 + 5 + 5 &= 16p + 20q + 2 \\ \text{Or}\end{aligned}$$

$$\begin{aligned}4p + 4p + 4p + 4p + 5q + 5q + 5q + 5q + 2(-4) \\ + 2(5) &= 16p + 20q + 2\end{aligned}$$

Or

$$\begin{aligned}2(4p + 5q + (-4) + 5) + 2(4p + 5q) \\ = 16p + 20q + 2\end{aligned}$$

We can add them in many more ways and will get the same result.

(Answer may vary)

(b) Same as part (a). Sum: $84k - 28g$

10. (a) Expression: $3x + 5y - 2z$

Incorrect form: $6xyz$

Mistake: The student added constants and multiplied variables.

Correct form: $3x + 5y - 2z$

(b) Expression: $5 - (2 - 6z)$

Incorrect form: $3 - 6z$

Mistake: $5 - (2 - 6z) = 5 - 2 - 6z$
 $= 3 - 6z.$

The minus sign outside the bracket was not applied to both terms.

Correct Working: $5 - (2 - 6z) = 5 - 2 + 6z$
 $= 3 + 6z$

(c) Expression: $3x + 4y - (5x - 4z)$

Incorrect form: $8x + 4y - 4z$

Mistake: Signs inside bracket were not changed properly.

Correct Working:

$3x + 4y - (5x - 4z) = 3x + 4y - 5x + 4z$
 $= -2x + 4y + 4z$

(d) Expression: $5(2a + 3b + 4c)$

Incorrect form: $10a + 3b + 4c$

Mistake: 5 was not multiplied with every term.

Correct form: $10a + 15b + 20c$

(e) Expression: $2 + (m + 4)$

Incorrect form: $2m + 6$

Mistake: 2 was wrongly multiplied with m .

Correct form: $m + 6$

(f) Expression: $3j + 6k + 9h + 12$

Incorrect form: $3(j + k + h) + 4$

Mistake: 3 is not taken correctly as a common factor from all terms.

Correct form: $3(j + 2k + 3h + 4)$

(g) Expression: $-5(-4 + 3a + 2b)$

Incorrect form: $-20 - 15a + 10b$

Mistake: Signs were multiplied incorrectly.

Correct form: $20 - 15a - 10b$

Maths Fun (Page 85)

$3(y + 5) - 10 = 3y + 15 - 10 = 3y + 5$

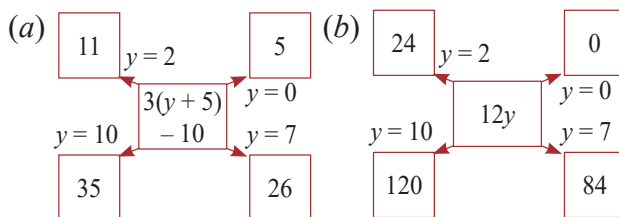
For $y = 2$, $3y + 5 = 3(2) + 5 = 11$;

for $y = 0$, $3(0) + 5 = 5$;

for $y = 7$, $3(7) + 5 = 26$;

for $y = 10$, $3(10) + 5 = 35$.

The values for the second shape can also be found in the same way.



Fast Check (Page 86)

Like terms are the terms having the same variable(s).

$(11x, -24x, x)$, $(-24y, 11y, y)$, $(11, -24, 1)$

Mental Maths (Page 91)

1. Product of 3 and $y \rightarrow 3y$

6 less than that $\rightarrow 3y - 6$

2. Substitute $p = 5$ in $2p + 4$,

$2p + 4 = 2(5) + 4$

$= 10 + 4 = 14$

3. $4(2x - 1) + 3x + 11 = 8x - 4 + 3x + 11$

$= 11x + 7$

4. Product of a and $b \rightarrow ab$

ab added to 7 $\rightarrow ab + 7$

5. Substitute $x = 4$ in $10 + 3(x + 2)$, to get

$10 + 3(x + 2) = 10 + 3(4 + 2)$

$= 10 + 3(6) = 10 + 18 = 28$

Practice Time 4C

1. (a) **Step 1:** Write the expressions with the '+' sign between them.

$(7p + 6q) + (5p - q) + (q + 16p)$

Step 2: Open the brackets.

$7p + 6q + 5p - q + q + 16p$

Step 3: Group the like terms together.

$(7p + 5p + 16p) + (6q - q + q)$

Step 4: Add the like terms.

$28p + 6q$

Therefore,

$(7p + 6q) + (5p - q) + (q + 16p) = 28p + 6q$

Same as part (a)

(b) $(a + 5b + 7c) + (2a + 10b + 9c)$

$= 3a + 15b + 16c$

(c) $(mn + t) + (2mn - 2t) + (-3t + 3mn) = 6mn - 4t$

(d) $(u + v) + (u - v) + (2u + 5v) + (2u - 5v) = 6u$



$$(e) (5xyz - 3xy) + (3xyz - 5xy) = 8xyz - 8xy$$

$$(f) (17ab - 13kl - 5xy) + (7xy + 12kl - 5ab) + (3xy - 4kl - ab) = 11ab - 5kl + 5xy$$

$$(g) (-3ab + 7cd - 5qr) + (2ry + 8qr - cd) + (2cd - 3qr + ab - 2ry) = -2ab + 8cd$$

$$(h) (p - q + 7r) + (6q + r - 7p) + (2p - 3r + 4q) + (6q - 7p) = -11p + 15q + 5r$$

2. (a) **Step 1:** Write the minuend within brackets as the first expression.

$$(27x + 5y - 43)$$

Step 2: Put a '-' sign and write the second expression within brackets.

$$(27x + 5y - 43) - (13x + 12y - 5)$$

Step 3: Distribute the negative sign.

$$27x + 5y - 43 - 13x - 12y + 5$$

Step 4: Group the like terms together.

$$= (27x - 13x) + (5y - 12y) + (-43 + 5)$$

Step 5: Combine like terms.

$$14x - 7y - 38$$

Therefore,

$$(27x + 5y - 43) - (13x + 12y - 5) = 14x - 7y - 38$$

Same as part (a)

$$(b) (p - 2q + 7) - (3p + 5) = -2p - 2q + 2$$

$$(c) (3m - 7n) - (m + n) = 2m - 8n$$

$$(d) (6z - 5y) - (2y + z) = 5z - 7y$$

$$(e) [6a - (9b + 18)] - (9a - 6b + 14) = -3a - 3b - 32$$

$$(f) (7h - 8g + 20) - (8g + 4h - 10) = 3h - 16g + 30$$

$$(g) (3ab + 5cd - 4ac - 6bd) - (3ab + 6cd - 3ac - 5bd) = -cd - ac - bd$$

$$(h) (4a - 3b + 5c) - (3a - 2b - c) = a - b + 6c$$

3. (a) $(x + y - z) + (3x - 5y + 7z) - (14x + 7y - 6z)$
 $= x + y - z + 3x - 5y + 7z - 14x - 7y + 6z$
 $= (x + 3x - 14x) + (y - 5y - 7y) + (-z + 7z + 6z)$
 $= -10x - 11y + 12z$

$$(b) p + p + 2 + p + 3 - p - 4 - p - 5 + p + 10$$

$$= (p + p + p - p - p + p) + (2 + 3 - 4 - 5 + 10)$$

$$= 2p + 6$$

$$(c) n + (m + 1) + (n + 2) + (m + 3) + (n + 4) + (m + 5)$$

$$= n + m + 1 + n + 2 + m + 3 + n + 4 + m + 5$$

$$= (n + n + n) + (m + m + m) + (1 + 2 + 3 + 4 + 5)$$

$$= 3n + 3m + 15$$

$$(d) (x + 3) + (2x - 1) + (3x - 7) - (6x - 9)$$

$$= x + 3 + 2x - 1 + 3x - 7 - 6x + 9$$

$$= (x + 2x + 3x - 6x) + (3 - 1 - 7 + 9) = 4$$

$$(e) 3a + 9b - 6 + 8a - 4b - 7a + 16$$

$$= (3a + 8a - 7a) + (9b - 4b) + (-6 + 16)$$

$$= 4a + 5b + 10$$

$$(f) 23 + 4(6m - 3n) - 8n - 3m - 18$$

$$= 23 + 24m - 12n - 8n - 3m - 18$$

$$= (24m - 3m) + (-12n - 8n) + (23 - 18)$$

$$= 21m - 20n + 5$$

$$(g) 2x - 5\{3x - (28x - 63)\}$$

$$= 2x - 5(3x - 28x + 63)$$

$$= 2x - 5(-25x + 63)$$

$$= 2x + 125x - 315$$

$$= 127x - 315$$

$$(h) 4x - 3\{x - (1 - y) + 2(1 - x)\}$$

$$= 4x - 3[x - 1 + y + 2 - 2x]$$

$$= 4x - 3[-x + y + 1]$$

$$= 4x + 3x - 3y - 3$$

$$= 7x - 3y - 3$$

$$(i) 3p - [5q - \{6q + 2(10q - p)\}]$$

$$= 3p - [5q - (6q + 20q - 2p)]$$

$$= 3p - [5q - (26q - 2p)]$$

$$= 3p - (5q - 26q + 2p)$$

$$= 3p - (-21q + 2p)$$

$$= 3p + 21q - 2p = p + 21q$$

4. (a) Let the top two blades of the number machine be 'a' (left number) and 'b' (right number). Then the general rule is $a + b - 2$, which gives the value for the bottom blade.

$$5 + 2 - 2 = 5, 8 + 1 - 2 = 7, 9 + 11 - 2 = 18, 10 + 10 - 2 = 18$$

Therefore, for the last number machine:

$$a + b - 2.$$

- (b) Let the top two blades of the number machine be 'a' (left number) and 'b' (right number). Then the general rule is $ab + 1$, which gives the value for the bottom blade.

$$4 \times 1 + 1 = 5, 6 \times 0 + 1 = 1, 3 \times 2 + 1 = 7, 10 \times 3 + 1 = 31$$

5. The colours repeat as: Red, Green, Yellow, Red, Green, Yellow, ...

So, the pattern repeats every 3 colours.

$$90 \div 3 = 30, \text{ remainder } 0$$

Remainder 0 \rightarrow Yellow

- D. 1.** Given that the length is 4 m less than 3 times the breadth.

$$\text{Breadth} = b$$

$$3 \text{ times breadth} = 3b$$

$$\text{Length} = 4 \text{ less than } 3b = 3b - 4$$

Therefore, the required length is $(3b - 4)$ metres.

- 2.** Speed of bus = v km/h

$$\text{Total time the bus travelled} = 5 \text{ hours}$$

$$\text{Distance travelled} = \text{Speed} \times \text{Time} = 5v$$

The bus is still 45 km away from Lucknow.

$$\text{Total distance} = \text{Distance travelled} + \text{Remaining distance} = 5v + 45$$

Therefore, the total distance in terms of v is $(5v + 45)$ km.

- 3. (a) (i)** Aman is y years old.

$$\text{Age after 5 years} = y + 5$$

$$(ii) \text{ Age 3 years ago} = y - 3$$

- (b)** Father's age = 5 years more than 3 times Aman's age

$$3 \text{ times Aman's age} = 3y$$

$$\text{Therefore, father's age} = 3y + 5$$

- 4.** Cost C of hiring a room

$$C = 150 + 30g$$

where g = number of guests

- (a)** For 20 guests, substitute $g = 20$, in

$$C = 150 + 30g, \text{ we get}$$

$$C = 150 + 30(20)$$

$$C = 150 + 600$$

$$C = 750$$

Therefore, the required cost is ₹750.

- (b)** For 50 guests, substitute $g = 50$, in

$$C = 150 + 30g, \text{ we get}$$

$$C = 150 + 30(50)$$

$$C = 150 + 1500$$

$$C = 1650$$

Therefore, the required cost is ₹1650.

- (c)** For 90 guests, substitute $g = 90$, in

$$C = 150 + 30g, \text{ we get}$$

$$C = 150 + 30(90)$$

$$C = 150 + 2700$$

$$C = 2850$$

Therefore, the required cost is ₹2850.

$$5. (a) 3(m - 5) + m = 3m - 15 + m = 4m - 15$$

$$(b) 4(3k + 2 + 6k) = 4(9k + 2) = 36k + 8$$

$$(c) 16x + 2 + 5 - 2x = (16x - 2x) + (2 + 5) \\ = 14x + 7$$

$$(d) 4(a - 5) + 3a = 4a - 20 + 3a = 7a - 20$$

$$(e) 2(m + n - 3) + 4(2m - 7n + 8) - 3(5n - 8) \\ + 7m$$

$$= 2m + 2n - 6 + 8m - 28n + 32 - 15n + \\ 24 - 21m$$

$$= (2m + 8m - 21m) + (2n - 28n - 15n) + \\ (-6 + 32 + 24)$$

$$= -11m - 41n + 50$$

$$(f) 3 - (4 - 5p) + [3 - \{7 - 8p + 9 - (5p - 3)\}]$$

Solve the inner bracket

$$7 - 8p + 9 - (5p - 3) = 7 - 8p + 9 - 5p + 3 \\ = 19 - 13p$$

Substitute back

$$= 3 - (4 - 5p) + [3 - \{19 - 13p\}]$$

Open brackets

$$= 3 - 4 + 5p + 3 - 19 + 13p$$

Combine like terms

p -terms:

$$5p + 13p = 18p$$

Constants:

$$3 - 4 + 3 - 19 = -17$$

$$\text{Therefore, } 3 - (4 - 5p) + [3 - \{7 - 8p + \\ 9 - (5p - 3)\}] = 18p - 17$$

- 6.** The matchsticks are in the following pattern:

3, 5, 7, 9, 11, ...

The general term for this pattern is $(2n + 1)$

$$\text{For 38th step, the number of matchsticks} = \\ 2(38) + 1 = 77$$

$$\text{For 89th step, the number of matchsticks} = \\ 2(89) + 1 = 179$$

$$\text{For 107th step, the number of matchsticks} = \\ 2(107) + 1 = 215$$

- 7.** Position of Beena: Meena is at step s , and Beena is 8 steps ahead of Meena.

$$\text{So, Beena's step} = s + 8$$

Therefore, Beena is at the step $s + 8$.

Position of Sakina: Sakina is 7 steps behind Meena.

$$\text{So, Sakina's step} = s - 7$$

Therefore, Sakina is at the step $s - 7$.

Total number of steps to the hill top: Total steps

are 10 less than 4 times the steps climbed by Meena.

Four times Meena's steps = $4s$

10 less than this: $4s - 10$

Therefore, the total number of steps = $4s - 10$

8. Number of students = p

Money collected per student = ₹50

Total money collected = $50 \times p = ₹50p$

Advance paid for transportation = ₹1800

Money left = $50p - 1800$

Therefore, the total money left to spend
= ₹ $(50p - 1800)$.

9. Total number of blue sticks = $4 + 3 + 2 + 1 = 10$

So, total length of the blue sticks = $10b$

Total number of red sticks = $8 + 6 + 4 + 2 = 20$

So, total length of the red sticks = $20r$

Therefore,

The total length of the sticks in the given pattern = $10b + 20r$.

10. (a) Cost of material for one bookmark = ₹15

Cost for b bookmarks = $15b$

Cost of material for one keychain = ₹20

Cost for k keychains = $20k$

Total cost of materials = $15b + 20k$

Therefore, the required expression is
 $15b + 20k$.

(b) Profit = Selling price – Cost price

Profit on one bookmark = $25 - 15 = 10$

Profit from b bookmarks = $10b$

Profit on one keychain = $35 - 20 = 15$

Profit from k keychains = $15k$

Total profit = $10b + 15k$

Therefore, the required expression is $10b + 15k$.

(c) To find the total profit when 120 bookmarks and 80 keychains are sold, we need to substitute $b = 120$, $k = 80$ in $10b + 15k$.

Total profit = $10(120) + 15(80)$

= $1200 + 1200 = 2400$

Therefore, the total profit is ₹2400.

(d) Total profit = $10b + 15k$

For. Profit = 3000 and $k = 100$, we have

$$10b + 15(100) = 3000$$

$$\Rightarrow 10b + 1500 = 3000$$

$$\Rightarrow 10b = 3000 - 1500 = 1500$$

$$\Rightarrow b = 150$$

Therefore, students must sell 150 bookmarks.

Challenge Question (Page 95)

In the given pyramid, the expression in each cell is the sum of the expressions in the two cells just below it.

For the second row from the bottom, we have

$$(y + 1) + (y + 6) = 2y + 7,$$

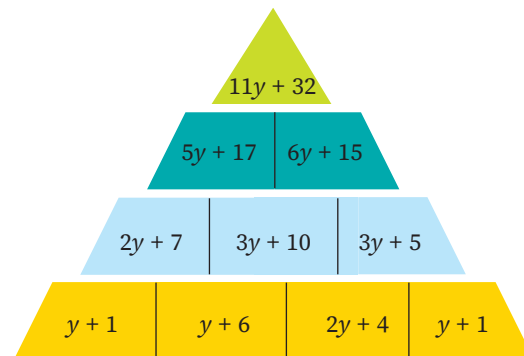
$$(y + 6) + (2y + 4) = 3y + 10,$$

$$(2y + 4) + (y + 1) = 3y + 5$$

For the third row from the bottom, we have

$$(2y + 7) + (3y + 10) = 5y + 17,$$

$$(3y + 10) + (3y + 5) = 6y + 15$$



Maths Connect (Page 96)

(a) Carbohydrates (in grams) for per unit of potato is 22, and for per unit of rajma is 60. Therefore, the expression for the carbohydrates (in grams) for x units of potatoes and y units of rajma is $22x + 60y$

(b) Same as part (a) $8x + 14y$