

Intellectual Mathematics

Teacher's Manual

Class VI

Written by :
Author's Team
(Vidyalaya Prakashan)

Vrindavan Books International
New Delhi

C o n t e n t s

UNIT 1 : NUMBER SYSTEM

1. Knowing Our Numbers	3
2. Playing with Numbers	11
3. Whole Numbers	37
4. Negative Numbers and Integers	51
5. Fractions	56
6. Decimals	75

UNIT 2 : ALGEBRA

7. Introduction to Algebra	85
----------------------------	----

UNIT 3 : COMMERCIAL MATHEMATICS

8. Ratio and Proportion	89
-------------------------	----

UNIT 4 : GEOMETRY

9. Basic Geometrical Concepts	99
10. Understanding Elementary Shapes	103
11. Three Dimensional Shapes	108
12. Symmetry (Reflection)	109

UNIT 5 : MENSURATION

14. Perimeter and Area	110
------------------------	-----

UNIT 6 : STATISTICS

15. Data Handling	118
-------------------	-----

Vrindavan Books International

New Delhi

Sales Office :

C-24, Jwala Nagar, Transport Nagar, Meerut - 250002

Ph. : 0121 - 2400630, 8899271392

Head Office :

A-102, Chandar Vihar, Delhi - 110092

e-mail : vidyalayaprakashan@yahoo.in

Knowing Our Numbers**Exercise 1A**

1. (i) 8,572 (ii) 43,062 (iii) 2,01,405 (iv) 19,08,006
(v) 10,12,11,302
2. (i) Fifty two thousand three.
(ii) Six lakh fifteen thousand seventy four
(iii) Twenty five lakh twenty thousand seven
(iv) Three crore ten lakh two thousand five hundred thirteen
(v) Six crore fifteen thousand four hundred six
(vi) Eighteen crore eighteen lakh eight thousand seven hundred
3. (i) $2 \times 100000 + 1 \times 10000 + 7 \times 1000 + 8 \times 100 + 1 \times 10 + 6 \times 1$
(ii) $1 \times 1000000 + 5 \times 100000 + 4 \times 1000 + 5 \times 100 + 1 \times 10 + 8 \times 1$
(iii) $4 \times 10000000 + 3 \times 1000000 + 6 \times 100000 + 1 \times 10000 + 7 \times 1000 + 2 \times 100 + 8 \times 10 + 5 \times 1$
(iv) $5 \times 10000000 + 5 \times 100000 + 5 \times 1000 + 5 \times 1$
(v) $8 \times 10000000 + 9 \times 100000 + 1 \times 10000 + 4 \times 100 + 2 \times 10$
(vi) $7 \times 100000000 + 4 \times 1000000 + 9 \times 100000 + 8 \times 10000 + 3 \times 1000 + 1 \times 100 + 6 \times 10$
4. (i) 8,20,385
(ii) 45,76,402
(iii) 2,05,06,873
5. The place value of 7 at ten lakh place = 70,00,000
The place value of 7 at hundred place = 700
Hence, the difference = $70,00,000 - 700$
 $= 69,99,300$
6. The place value of 9 is $(9 \times 10,00,000) = 90,00,000$

The place face of 9 is = 9

So, difference = $9000000 - 9 = 8999991$

7. Using these digits,

The greatest 5 digit number = 65420

The smallest 5 digit number = 20456

8. The largest 6 digit number = 999999

The smallest 6 digit number = 100000

Number of all 6-digit numbers = $(999999 - 100000) + 1$

$$= (899999 + 1) = 900000$$

Hence, the number of all 6-digit numbers is 900000.

9. The number is 547

On reversing it we get = 745

So, the difference = $745 - 547 = 198$

10. In 83067524, the digit 4 is having place and face value = 4

The digit zero is also having equal place and face value.

Hence, 4 and 0 are the two digits having same place and face value.

11. (i) 530; 503; 350; 305

(ii) 555, 553, 535, 533, 333, 335, 355, 353, 550, 505, 530, 500, 300, 330, 350, 305

12. (i) 4,000,440

(ii) 20,130,203

(iii) 64,203,008

13. (i) Six hundred forty five thousand seven hundred thirty two.

(ii) Seven million forty eight thousand nine hundred seventy three.

(iii) Forty six million eight hundred twenty three thousand seven hundred forty

(iv) Twenty eight million six hundred two thousand eighty four.

(v) Ninety eight million five hundred thirty six thousand four.

(vi) Eighty million six hundred four thousand five

Exercise 1B

1. (i) $=$ (ii) $>$ (iii) $>$ (iv) $<$
2. (i) 900000, 9234070, 9234080, 9234082
(ii) 80000, 70125067, 71025067, 701035070
(iii) 900000, 37218027, 352137036, 362147009
(iv) 666666, 3456789, 26875709, 80506100
3. (i) 22266775, 3066666, 2000000, 1224456
(ii) 7200072, 7100008, 7100007, 701035070
(iii) 87865432, 87654321, 80706050, 76543210
(iv) 62967821, 61318417, 50008327, 49698870
4. (i) $648083 + 1 = 648084$
(ii) $1347000 + 1 = 1347001$
(iii) $599999 + 1 = 600000$
(iv) $5432106 + 1 = 5432107$
5. (i) $758989 - 1 = 758988$
(ii) $663090 - 1 = 663089$
(iii) $566666 - 1 = 566665$
(iv) $3689000 - 1 = 3688999$

Exercise 1C

1. We know that
 $1 \text{ kg} = 1000000 \text{ mg}$ and $1 \text{ g} = 1000 \text{ mg}$
So,
 $14 \text{ kg } 250 \text{ gm} = 1,42,50,000 \text{ mg}$
2. Combined population = Population of (Bihar + Rajasthan + Uttar Pradesh)
 $= 6,64,73,122 + 5,63,72,124 + 8,64,55,209$
 $= 209800455$
3. Company earned in 2008 $= ₹ 56743970$
Increased in company earning in 2009 $= ₹ 24867540$
 $= ₹ 81611510$

Total earning in 2009 $= ₹ 81611510$

$$\begin{array}{rcl}
 4. \text{ Smaller number} & = & 5762436 \\
 \text{Difference between numbers} & = & + \quad 8365472 \\
 \text{Greater number} & = & \underline{14127908} \\
 5. \text{ Book worth sold in first week} & = & 395875 \\
 \text{Book worth sold in second week} & = & + 286485 \\
 \text{Total book worth sold for the two weeks} & = & \underline{682860}
 \end{array}$$

As in first week the sale of book is greater as,

$$395875 > 286485$$

$$\begin{array}{rcl}
 \text{Book sold in first week} & = & ₹ 395875 \\
 \text{Book sold in second week} & = & - ₹ 286485 \\
 \text{First week sale is greater by} & = & \underline{₹ 108890} \\
 6. \text{ Greater number being formed} & = & 86543 \\
 \text{Smallest number being formed} & = & - 34568 \\
 \text{Difference} & = & \underline{51975} \\
 7. \text{ Annual fee per student} & = & ₹ 75408 \\
 \text{Number of students} & = & \times 978 \\
 \text{Total fee collected annually} & = & \underline{₹ 7379024} \\
 8. \text{ Student multiplied} & = & 8347 \\
 \text{by} & = & \times 54 \\
 \text{We get} & = & \underline{450738}
 \end{array}$$

But

$$\begin{array}{rcl}
 \text{Student has to be multiplied} & = & 8347 \\
 \text{by} & = & \times 45 \\
 \text{We will get} & = & \underline{375615}
 \end{array}$$

So, the difference between two calculation is

$$\begin{array}{r}
 450738 \\
 - 375615 \\
 \hline
 75,123
 \end{array}$$

Hence, his answer was greater than the correct answer by 75123.

9. 44 meter cloth is required for 16 shirts
 For 1 shirt the cloth required is $= 44 \div 16$
 $= 2.75$ metres

10. 10 kg 600 g or $= 10.6$ kg
 8 packet mass $= 10.6$ kg
 1 packet mass $= (10.6 \div 8)$ kg
 $= 1.325$ kg

So, the mass of each packet $= 1.325$ kg

Exercise 1D

- (i) XLVIII (ii) LXXXIV (iii) CII (iv) CXXIV
 (v) CDXXIV (vi) MIII (vii) MMCDLVI (viii) $\overline{\text{IVCCI}}$
 (ix) $\overline{\text{XVI}}$ (x) $\overline{\text{XXVCMXVIII}}$
- (i) 24 (ii) 99 (iii) 79 (iv) 98 (v) 254 (vi) 944
 (vii) 1019 (viii) 1565 (ix) 949 (x) 60019
- (ii), (iv), (v), (vii), (viii), (ix), (x)

Exercise 1E

- | | |
|-----------------|------------------|
| (i) 74—70 | (ii) 88—90 |
| (iii) 873—870 | (iv) 707—710 |
| (v) 1308—1310 | (vi) 1682—1680 |
| (vii) 2345—2350 | (viii) 7555—7560 |
- | | |
|-------------------|--------------------|
| (i) 546—500 | (ii) 2066—2100 |
| (iii) 4672—4700 | (iv) 6686—6700 |
| (v) 12340—12300 | (vi) 29850—29900 |
| (vii) 35850—35900 | (viii) 44477—44500 |
- | | |
|---------------------|----------------------|
| (i) 45600—46000 | (ii) 8956—9000 |
| (iii) 9879—10000 | (iv) 18490—18000 |
| (v) 48866—49000 | (vi) 65777—66000 |
| (vii) 853436—853000 | (viii) 936942—937000 |
- | | |
|-------------|--------------------------|
| (i) 785 | — ₹ 790, ₹ 800, ₹ 1000 |
| (ii) 2025 | — ₹ 2030, ₹ 2000, ₹ 2000 |
| (iii) 525m | — 530m, 500m, 1000m |
| (iv) 2387 m | — 2390m, 2400m, 2000m |
| (v) 650 cm | — 650cm, 700cm, 1000cm |

- (vi) 1256 km — 1260km, 1300cm, 1000km
 (vii) 960 g — 960g, 1000g, 1000g
 (viii) 750 kg — 750kg, 800kg, 1000kg
5. Smallest number = 6500
 Greatest number = 7499

Exercise 1F

1. (i) $56 + 33 = 60 + 30 = 90$
 (ii) $42 + 77 = 40 + 80 = 120$
 (iii) $85 + 18 = 90 + 20 = 110$
 (iv) $13 + 68 = 10 + 70 = 80$
 (v) $185 + 256 = 190 + 260 = 450$
 (vi) $487 + 273 = 440 + 270 = 760$
2. (i) $88 - 32 = 90 - 30 = 60$
 (ii) $1253 - 691 = 1250 - 690 = 560$
 (iii) $6481 - 3848 = 6480 - 3850 = 2630$
 (iv) $5366 - 2830 = 5370 - 2830 = 2540$
 (v) $8654 - 759 = 8660 - 760 = 7900$
 (vi) $25448 - 6314 = 25400 - 6300 = 19100$
3. (i) $523 \times 81 = 500 \times 80 = 40000$
 (ii) $365 \times 37 = 400 \times 40 = 16000$
 (iii) $9146 \times 24 = 9100 \times 20 = 182000$
 (iv) $544 \times 56 = 500 \times 60 = 30000$
 (v) $712 \times 33 = 700 \times 30 = 21000$
 (vi) $1980 \times 63 = 2000 \times 60 = 120000$
4. (i) $72 \div 7 = 70 \div 7 = 10$
 (ii) $83 \div 17 = 100 \div 20 = 5$
 (iii) $193 \div 24 = 200 \div 20 = 10$
 (iv) $1235 \div 11 = 1200 \div 10 = 120$
 (v) $745 \div 24 = 700 \div 20 = 35$
 (vi) $8706 \div 293 = 9000 \div 300 = 30$

Check Your Mental Maths IQ

1. (i) 100 (ii) 100000 (iii) 1000 (iv) 10
2. (i) 3 (ii) 2

3. (i) 1028, 1082, 1208, 1280, 1802, 1820, 2018, 2081, 2108, 2180, 2801, 2810, 8012, 8021, 8102, 8120, 8201, 8210
 (ii) 8210, 8201, 8120, 8102, 8021, 8012, 2810, 2801, 2180, 2108, 2081, 2018, 1820, 1802, 1280, 1208, 1082, 1028
 (iii) Smallest = 1028, greatest = 8210
4. (i) 121 (ii) 79 (iii) 500 (iv) 1000
5. 85,34,000
6. 100 thousands = 1 lakh
7. 10 million = 1 crore
8. $5638999 + 1 = 5639000$
9. $10000000 - 1 = 9999999$

Multiple Choice Questions

1. (iii) 102
2. (i) 49500;
 The place value of 5 at ten thousand place = 50000
 The place value of 5 at hundred place = 500
 difference = $50000 - 500$
 = 49500
3. (iv) 8008808;
 The place value of 8 at 10 lakh = 8000000
 The place value of 8 at 10 thousand = 80000
 The place value of 8 at thousand = 8000
 The place value of 8 at ones = 8
 Sum = 8008808
4. (i) 495;
 The place value of 5 at hundred = 500
 The face value of 5 = 5
 Difference $\begin{array}{r} \\ \\ \hline \\ \hline \end{array}$ = 495
5. (ii) 100000;
 5-digit greater number = 99999
 Successor of it = $\begin{array}{r} \\ \\ \hline \\ \hline \end{array}$ = 100000

6. (ii) 99999;

$$\begin{array}{rcl} \text{6-digit smaller number} & = & 100000 \\ \text{prodeceser of it} & = & \begin{array}{r} - \quad 1 \\ \hline 99999 \end{array} \end{array}$$

7. (iii) 900009

8. (iii) 900000

9. (ii) 240

$$\text{CCXL} = 240$$

10. (ii) 19,000

$$6754 + 12360 = 7000 + 12000 = 19000$$

11. (iii) 100

2

Playing with Numbers

Exercise 2A

1. (i) **Factor** : A number, which divides the dividend completely leaving no remainder is known as the number's factor.
For example 2, 3 and 5 are factors of 30.
- (ii) **Multiple** : When a divisor divides a number such that there is no remainder left, then the dividend is called the multiple of the divisor. For example 30 is multiple of 2, 3 and 5.
2. (i) 10 — 1, 2, 5, 10
(ii) 15 — 1, 3, 5, 15
(iii) 32 — 1, 2, 4, 8, 16, 32
(iv) 45 — 1, 3, 5, 9, 15, 45
(v) 75 — 1, 3, 5, 15, 25, 75
(vi) 168 — 1, 2, 3, 4, 6, 7, 8, 12, 14, 21, 28, 42, 56, 84, 168
(vii) 729 — 1, 3, 9, 27, 81, 243, 729
3. (i) 9 — 9, 18, 27, 36, 45
(ii) 15 — 15, 30, 45, 60, 75
(iii) 24 — 24, 48, 72, 96, 120
(iv) 75 — 75, 150, 225, 300, 375
(v) 80 — 80, 160, 240, 320, 400
(vi) 85 — 85, 170, 255, 340, 425
(vii) 99 — 99, 198, 297, 396, 495
4. (i) even (ii) odd (iii) even (iv) even (v) odd
(vi) even (vii) odd
5. (i) 2 (ii) 2 (iii) 3
(iv) 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89
6. (i) 89 (iv) 73

7. (i) **Composite Numbers** : Numbers that have 3 or more factors are called composite numbers.
Yes, a composite number can be odd. 9 is the smallest odd composite number.
8. (i) Prime numbers that differ by 2 are called twin primes.
(ii) Two natural numbers which have only the common factor 1 are called co-primes.
(iii) If the sum of all the factors of a number is two times the number then the number is called perfect number.
9. (i) 36 — 17, 19 (ii) 84 — 37, 47
(iii) 98 — 19, 79

Exercise 2B

1. (i) by 2 (a) 12650 0 last digit, even; Yes
 (b) 843425 5 last digit; odd; No
 (c) 266312 2 last digit; even; Yes
- (ii) by 3 and 9
(a) 70335
Sum of digits = $7 + 3 + 3 + 5 = 18$
As 18 is divisible by 3 and 9. So, Yes.
- (b) 607439
Sum of digits = $6 + 0 + 7 + 4 + 3 + 9 = 29$
as 29 is not divisible by 3 and 9. So, No.
- (c) 187245
Sum of digits = $1 + 8 + 7 + 2 + 4 + 5 = 27$
as 27 is divisible by 3 and 9; so, Yes.
- (iii) by 4 and 8
(a) 8364
Divisibly 4; number formed by its ten's place is $64 \div 4 = 16$
Divisibility by 8; number formed by hundred, tens and units place is $364 \div 8 = \text{No}$
So No.
- (b) 7314
Divisibility by 4; $14 \div 4 = \times$

So, No.

(c) 36712

Divisibility by 4; $12 \div 4 = 3$

Divisibility by 8 = $712 \div 8 = 89$

So, Yes

(iv) by 5 and 10

(a) 4965, last **one's** digit 5 but not 0 so it is divisible by 5 not by 10.

(b) 23480, one's digit 0 so, divisible by 5 and 10.

(c) 723408, one's digit 8. So, none of it is divisible by 5 and 10.

(v) by 6

(a) 3060, even number at one's place and $3 + 6 = 9$ is divisibly by 3; so it is divisible by 6.

(b) 27436, even number at one's place and $2 + 7 + 4 + 3 + 6 = 22$ is not divisibly by 3. No.

(c) 251730, even number at one's place and $2 + 5 + 1 + 7 + 3 = 18$ is divisibly by 3. Yes

(vi) by 11

(a) 94897

Sum of its digit in odd place = $7 + 8 + 9 = 24$

Sum of its digit in even place = $9 + 4 = 13$

Difference of those sum ($24 - 13 = 11$)

which is divisible by 11. Yes

(b) 7264532 (a), (b), (c) Ans.

Sum of digit at odd place = $2 + 5 + 6 + 7 = 20$

Sum of digit at even place = $3 + 4 + 2 = 9$

Difference of these sum ($20 - 9 = 11$)

which is divisible by 11. Yes

(c) 6253038

Sum of digit at odd place = $8 + 5 + 6 = 19$

Sum of digit at even place = $3 + 3 + 2 = 8$

Difference of these sum ($19 - 8 = 11$)

which is divisibly by 11. Yes.

2. (i) $27 * 4 = 2724 \div 3 = 908$
 $2 + 7 + * + 4 = 13 + *$ as least number is 2.
 which make $15 \div 3 = 5$
- (ii) $8 * 712 = 8 + * + 7 + 1 + 2 = 18 + *$ as least number of * is 0 as 18 is divisibly by 3.
- (iii) $234 * 17 = 2 + 3 + 4 + * + 1 + 7 = 17 + *$ as least number is 1 which make $18 \div 3 = 6$.
- (iv) $6 * 1054 = 6 + * + 1 + 0 + 5 + 4 = 16 + *$ as the least number be 2 which make $18 \div 3 = 6$.
3. (i) $2 * 135 = 2 + * + 1 + 3 + 5 = 11 + *$ as the least number be 7 which make $18 \div 9 = 2$.
- (ii) $6702 * = 6 + 7 + 2 + * = 15 + *$ as the least number be 3 which make $18 \div 9 = 2$.
- (iii) $66784 * = 6 + 6 + 7 + 8 + 4 + * = 31 + *$ as least number would be 5 which make $36 \div 9 = 4$.
- (iv) $835 * 86 = 8 + 3 + 5 + * + 8 + 6 = 30 + *$ as least number would be 6 which make $36 \div 9 = 4$.

4.

$$\begin{array}{r}
 4687 \\
 11 \overline{) 51549} \\
 \underline{44} \\
 75 \\
 \underline{66} \\
 94 \\
 \underline{88} \\
 69 \\
 \underline{77} \\
 -8
 \end{array}$$

So, we should add 8 to 51549 to make it exactly divisible by 11.

5. (i) 2 but not 4.
 6
- (ii) 3 but not 6
 9
- (iii) 3 but not 9
 12

Exercise 2C

1. 179 : Test of divisibility of 179 by each one 2, 3, 5, 7, 11, 13 but it is not divisible by anyone, so it is a prime number.
 - 277 : Test of divisibility 277 by each 2, 3, 5, 7, 11, 13 but it is not divisibly by any one; so it is a prime number.
 - 137 : Text of divisibility 137 by each 2, 3, 5, 7, 11, 13 but it is not divisible by any one; so it is a prime number.
 - 157 : Test of divisibility 157 by each 2, 3, 5, 7, 11, 13 but it is not divisible by any one. So it is a prime number.
 - 161 : Test of divisibility 161 by each 2, 3, 5, 7, 11, 13 and it is divisible by 7; $161 \div 7 = 23$. So it is not prime.
 - 291 : Test of divisibility 291 by each 2, 3, 5, 7, 11, 13 and it is divisible by 3; $291 \div 3 = 97$. So it is not prime.
 - 331 : To test its divisibility by each 2, 3, 5, 7, 11, 13 and it is not divisible by any one. So it is a prime.
 - 381 : To test its divisibility each by 2, 3, 5, 7, 11, 13 and it is divisible by 3, $381 \div 3 = 127$. So it is not prime.
 - 397 : To test its divisibility divide each by 2, 3, 5, 7, 11, 13 but it is not divisible by any one. So it is a prime.
2. For prime factorisation we use division method.

(i)

2	36
2	18
3	9
3	3
	1

$$2 \times 2 \times 3 \times 3$$

(ii)

2	64
2	32
2	16
2	8
2	4
2	2
	1

$$2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$\begin{array}{r|l}
 2 & 108 \\
 \hline
 2 & 54 \\
 \hline
 2 & 27 \\
 \hline
 3 & 9 \\
 \hline
 3 & 3 \\
 \hline
 & 1
 \end{array}$$

$$2 \times 2 \times 2 \times 3 \times 3$$

$$\begin{array}{r|l}
 2 & 234 \\
 \hline
 3 & 117 \\
 \hline
 3 & 39 \\
 \hline
 13 & 13 \\
 \hline
 & 1
 \end{array}$$

$$2 \times 3 \times 3 \times 13$$

$$\begin{array}{r|l}
 2 & 1224 \\
 \hline
 2 & 612 \\
 \hline
 3 & 306 \\
 \hline
 2 & 102 \\
 \hline
 3 & 51 \\
 \hline
 17 & 17 \\
 \hline
 & 1
 \end{array}$$

$$2 \times 2 \times 3 \times 2 \times 3 \times 17$$

$$\begin{array}{r|l}
 2 & 260 \\
 \hline
 2 & 130 \\
 \hline
 5 & 65 \\
 \hline
 13 & 13 \\
 \hline
 & 1
 \end{array}$$

$$2 \times 2 \times 5 \times 13$$

$$\begin{array}{r|l}
 5 & 945 \\
 \hline
 3 & 189 \\
 \hline
 3 & 63 \\
 \hline
 3 & 21 \\
 \hline
 7 & 7 \\
 \hline
 & 1
 \end{array}$$

$$5 \times 3 \times 3 \times 3 \times 7$$

$$\begin{array}{r|l}
 2 & 8712 \\
 \hline
 2 & 4356 \\
 \hline
 2 & 2178 \\
 \hline
 3 & 1089 \\
 \hline
 3 & 363 \\
 \hline
 11 & 121 \\
 \hline
 11 & 11 \\
 \hline
 & 1
 \end{array}$$

$$2 \times 2 \times 2 \times 3 \times 3 \times 11 \times 11$$

$$\begin{array}{r|l}
 7 & 9317 \\
 \hline
 11 & 1331 \\
 \hline
 11 & 121 \\
 \hline
 11 & 11 \\
 \hline
 & 1
 \end{array}$$

$$7 \times 11 \times 11 \times 11$$

$$\begin{array}{r|l}
 3 & 9000 \\
 \hline
 3 & 3000 \\
 \hline
 2 & 1000 \\
 \hline
 2 & 500 \\
 \hline
 2 & 250 \\
 \hline
 5 & 125 \\
 \hline
 5 & 25 \\
 \hline
 5 & 5 \\
 \hline
 & 1
 \end{array}$$

$$3 \times 3 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5$$

$$\begin{array}{r|l}
 5 & 13915 \\
 \hline
 11 & 2783 \\
 \hline
 11 & 253 \\
 \hline
 23 & 23 \\
 \hline
 & 1
 \end{array}$$

$$5 \times 11 \times 11 \times 23$$

$$\begin{array}{r|l}
 2 & 20570 \\
 \hline
 5 & 10285 \\
 \hline
 11 & 2057 \\
 \hline
 11 & 187 \\
 \hline
 17 & 17 \\
 \hline
 & 1
 \end{array}$$

$$2 \times 5 \times 11 \times 11 \times 17$$

3. Largest 4-digit number = 9999

$$\begin{array}{r|l}
 3 & 9999 \\
 \hline
 3 & 3333 \\
 \hline
 11 & 1111 \\
 \hline
 101 & 101 \\
 \hline
 & 1
 \end{array}$$

$$3 \times 3 \times 11 \times 101$$

4.

7	1729
13	247
19	19
	1

$$7 \times 13 \times 19$$

$$\text{As } (13 - 7) = 6, (19 - 13) = 6$$

two consecutive prime factors differ by 6.

Exercise 2D

1. (i)

2	24
2	12
2	6
3	3
	1

3	36
3	12
2	4
2	2
	1

$$2 \times 2 \times 2 \times 3$$

$$2 \times 2 \times 3 \times 3$$

Here 2 and 3 are common in both and they repeat two times 2 and one time 3.

$$\text{So, H.C.F.} = 2 \times 2 \times 3 = 12$$

(ii)

5	75
5	15
3	3
	1

5	125
5	25
5	5
	1

$$5 \times 5 \times 3$$

$$5 \times 5 \times 5$$

The common factor is 5 occur 2 times.

$$\text{H.C.F.} = 5 \times 5 = 25$$

(iii)

2	72
2	36
2	18
3	9
3	3
	1

$$2 \times 2 \times 2 \times 3 \times 3$$

2	162
3	81
3	27
3	9
3	3
	1

$$2 \times 3 \times 3 \times 3 \times 3$$

The common factor occur is 2 and 3 which occur as follow.

$$\text{H.C.F.} = 3 \times 3 \times 2 = 18$$

(iv)

2	48
2	24
2	12
2	6
3	3
	1

$$2 \times 2 \times 2 \times 2 \times 3$$

2	120
2	60
2	30
3	15
5	5
	1

$$2 \times 2 \times 2 \times 3 \times 5$$

The common factor occur are 2 and 3 which repeat to form. H.C.F. as follows

$$\text{H.C.F.} = 2 \times 2 \times 2 \times 3 = 24$$

(v)

2	154
7	77
11	11
	1

$$2 \times 7 \times 11$$

2	198
11	99
3	9
3	3
	1

$$2 \times 11 \times 3 \times 3$$

The common factor occur is 2 and 11 which repeat to form H.C.F. as follow.

$$\text{H.C.F.} = 2 \times 11 = 22$$

2	106
53	53
	1

3	159
53	53
	1

5	265
53	53
	1

2×53

3×53

5×53

As 53 is common so H.C.F. = 53.

2	144
2	72
2	36
2	18
3	9
3	3
	1

2	256
2	126
3	63
3	21
7	7
	1

3	630
3	210
7	70
2	10
5	5
	1

$2 \times 2 \times 3 \times 3 \times 7$

$2 \times 2 \times 2 \times 2 \times 3 \times 3$

$3 \times 3 \times 7 \times 2 \times 5$

As 2 and 3 are common in three and repeat to form H.C.F. as follow

$= 2 \times 3 \times 3 = 18$

5	625
5	125
5	25
5	5
	1

5	3215
5	625
5	125
5	25
5	5
	1

5	15625
5	3125
5	625
5	125
5	25
5	5
	1

5^4

5^5

5^6

As 5^4 is common through all so H.C.F. = 625.

2. (i) As 148 is smaller than 518 then

$$\begin{array}{r}
 148 \overline{) 518} \quad 3 \\
 \underline{- 444} \\
 74 \overline{) 148} \quad 2 \\
 \underline{148} \\
 \times \\
 \hline
 \end{array}$$

So, 74 is the H.C.F.

- (ii) As

$$\begin{array}{r}
 390 \overline{) 663} \quad 1 \\
 \underline{390} \\
 273 \overline{) 390} \quad 7 \\
 \underline{273} \\
 117 \overline{) 273} \quad 2 \\
 \underline{234} \\
 39 \overline{) 117} \quad 3 \\
 \underline{117} \\
 \times \\
 \hline
 \end{array}$$

So, 39 is the H.C.F.

(iii)

$$\begin{array}{r}
 780 \overline{) 936} \quad 1 \\
 \underline{780} \\
 156 \overline{) 780} \quad 5 \\
 \underline{780} \\
 \times \\
 \hline
 \end{array}$$

156 is the H.C.F.

(iv)

$$\begin{array}{r}
 1435 \overline{) 3535} \quad 2 \\
 \underline{2870} \\
 665 \overline{) 1435} \quad 2 \\
 \underline{1330} \\
 105 \overline{) 665} \quad 6 \\
 \underline{630} \\
 35 \overline{) 105} \quad 3 \\
 \underline{105} \\
 \times \\
 \hline
 \end{array}$$

So, 35 is the H.C.F.

$$\begin{array}{r}
 \text{(v)} \quad 7625 \overline{)8175} \quad 1 \\
 \underline{7625} \\
 550 \overline{)7625} \quad 13 \\
 \underline{7150} \\
 475 \overline{)550} \quad 1 \\
 \underline{475} \\
 75 \overline{)475} \quad 6 \\
 \underline{450} \\
 25 \overline{)75} \quad 3 \\
 \underline{75} \\
 \times
 \end{array}$$

So, H.C.F. is 25.

(vi) 1624, 522, 1276

$$\begin{array}{r}
 1276 \overline{)1624} \quad 1 \\
 \underline{1276} \\
 348 \overline{)1276} \quad 3 \\
 \underline{1044} \\
 232 \overline{)348} \quad 1 \\
 \underline{232} \\
 116 \overline{)232} \quad 2 \\
 \underline{232} \\
 \times
 \end{array}$$

$$\begin{array}{r}
 116 \overline{)522} \quad 4 \\
 \underline{464} \\
 58 \overline{)116} \quad 2 \\
 \underline{116} \\
 \times
 \end{array}$$

Hence, 58 is H.C.F.

(vii) 1794, 2346, 4761

$$\begin{array}{r}
 2346 \overline{) 4761} \quad 2 \\
 \underline{4692} \\
 69 \overline{) 2346} \quad 34 \\
 \underline{2346} \\
 \times \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 69 \overline{) 1794} \quad 26 \\
 \underline{1794} \\
 \times \\
 \hline
 \end{array}$$

Hence 69 is H.C.F.

(viii) 2241, 8217, 747

$$\begin{array}{r}
 2241 \overline{) 8217} \quad 3 \\
 \underline{6723} \\
 1494 \overline{) 2241} \quad 1 \\
 \underline{1494} \\
 747 \overline{) 1494} \quad 2 \\
 \underline{1494} \\
 \times \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 747 \overline{) 747} \quad 1 \\
 \underline{747} \\
 \times \\
 \hline
 \end{array}$$

H.C.F. = 747

3. 2211/5025, we take HCF

$$\begin{array}{r}
 2211 \overline{) 5025} \quad 2 \\
 \underline{4422} \\
 603 \overline{) 2211} \quad 3 \\
 \underline{1809} \\
 402 \overline{) 603} \quad 1 \\
 \underline{402} \\
 201 \overline{) 402} \quad 2 \\
 \underline{402} \\
 \times \\
 \hline
 \end{array}$$

$$\frac{2211}{5025} = \frac{2211 \div 201}{5025 \div 201} = \frac{11}{25}$$

4. We must find the greatest which divided $(245 - 5)$ and $(1029 - 5)$ respectively.

The H.C.F. of 240 and 1024 will be the largest number.

$$\begin{array}{r}
 240 \overline{) 1024} \quad 4 \\
 \underline{960} \\
 64 \overline{) 240} \quad 3 \\
 \underline{192} \\
 48 \overline{) 64} \quad 1 \\
 \underline{48} \\
 16 \overline{) 48} \quad 3 \\
 \underline{48} \\
 \times
 \end{array}$$

16 is Ans.

5. Clearly $(398 - 7)$, $(436 - 11)$, $(542 - 15)$ find out H.C.F. will be the largest number.

391, 425, 527

$$\begin{array}{r}
 425 \overline{) 527} \quad 1 \\
 \underline{425} \\
 102 \overline{) 425} \quad 4 \\
 \underline{408} \\
 17 \overline{) 102} \quad 6 \\
 \underline{102} \\
 \times
 \end{array}$$

$$\begin{array}{r}
 17 \overline{) 391} \quad 23 \\
 \underline{391} \\
 \times
 \end{array}$$

So largest number = 17

6. Two tankers contain 850 litre and 680 litre of petrol,
The maximum capacity of a container is H.C.F. of 680 and 850.

$$\begin{array}{r}
 680 \overline{) 850} \quad 1 \\
 \underline{680} \\
 170 \overline{) 680} \quad 4 \\
 \underline{680} \\
 \times
 \end{array}$$

So, 170 litre being the maximum capacity of a container.

7. $20\text{m } 16\text{ cm} = (20 \times 100 + 16) = 2016\text{ cm}$

$15\text{ m } 60\text{ cm} = (15 \times 100 + 60) = 1560\text{ cm}$

Taking out H.C.F., throughout

$$\begin{array}{r}
 1560 \overline{) 2016} 1 \\
 \underline{1560} \\
 456 \overline{) 1560} 3 \\
 \underline{1368} \\
 192 \overline{) 456} 2 \\
 \underline{384} \\
 72 \\
 \downarrow \\
 72 \overline{) 192} 2 \\
 \underline{144} \\
 48 \overline{) 72} 1 \\
 \underline{48} \\
 24 \overline{) 48} 2 \\
 \underline{48} \\
 \times
 \end{array}$$

So, H.C.F. = 24

As this means the size of square is 24 cm.

Area of square = 24×24

No. of stones = $\frac{2016 \times 1560}{24 \times 24} = 5460$ Ans.

No. of square stones involved are 5460.

8. 527 apples

646 pears

748 oranges

Greatest number will be its H.C.F.

$$\begin{array}{r}
 646 \overline{) 748} 1 \\
 \underline{646} \\
 102 \overline{) 646} 6 \\
 \underline{312} \\
 34 \overline{) 102} 3 \\
 \underline{102} \\
 \times
 \end{array}$$

$$\begin{array}{r}
 34 \overline{) 527} \begin{array}{l} 15 \\ 510 \\ \hline \end{array} \\
 \quad 17 \overline{) 34} \begin{array}{l} 2 \\ 34 \\ \hline \end{array} \\
 \quad \quad \times
 \end{array}$$

The greastest number of fruits being possible is 17.

$$\text{Find the No. of heaps (apple)} = \frac{527}{17} = 31$$

$$\text{Find the No. of heaps (pear)} = \frac{646}{17} = 38$$

$$\text{Find the number of heaps (orange)} = \frac{748}{17} = 44$$

$$\text{Total heaps formed} = 31 + 38 + 44 = 113$$

$$9. \text{ English books} = 96$$

$$\text{Hindi books} = 240$$

$$\text{Maths books} = 336$$

$$\text{So, H.C.F.} =$$

$$\begin{array}{r}
 240 \overline{) 336} \begin{array}{l} 1 \\ 240 \\ \hline \end{array} \\
 \quad 96 \overline{) 240} \begin{array}{l} 2 \\ 192 \\ \hline \end{array} \\
 \quad \quad 48 \overline{) 96} \begin{array}{l} 2 \\ 96 \\ \hline \end{array} \\
 \quad \quad \quad \times
 \end{array}$$

$$\text{So the stocks of English books} = \frac{96}{48} = 2$$

$$\text{Stocks of Hindi books} = \frac{240}{48} = 5$$

$$\text{Stocks of Maths books} = \frac{336}{48} = 7$$

Exercise 2E

1. (i) 24, 36

2	24
2	12
2	6
3	3
	1

$$2 \times 2 \times 2 \times 3$$

3	36
3	12
2	4
2	2
	1

$$3 \times 3 \times 2 \times 2$$

Maximum times of two occur is 3.

Maximum times of 3 occur is 2.

$$\text{L.C.M.} = 2 \times 2 \times 2 \times 3 \times 3 = 72$$

(ii) 64, 80

2	64
2	32
2	16
2	8
2	4
2	2
	1

$$2 \times 2 \times 2 \times 2 \times 2 \times 2$$

2	80
2	40
2	20
2	10
5	5
	1

$$2 \times 2 \times 2 \times 2 \times 5$$

Maximum times of 2 occur is 6.

Maximum times of 5 occur is 1.

$$\text{L.C.M.} = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 = 320$$

(iii) 12, 16, 18

2	12
2	6
3	3
	1

2	16
2	8
2	4
3	2
	1

2	18
3	9
3	3
	1

$$2 \times 2 \times 3 \qquad 2 \times 2 \times 2 \times 2 \quad 2 \times 3 \times 3$$

Maximum times of 2 occur is 4.

Maximum times of 3 occur is 2.

$$\text{L.C.M.} = 16 \times 9 = 144$$

(iv) 48, 72, 96

2	48
2	24
2	12
2	6
3	3
	1

2	72
2	36
2	18
3	9
3	3
	1

3	96
2	32
2	16
2	8
2	4
2	2
	1

$$2 \times 2 \times 2 \times 2 \times 3 \quad 2 \times 2 \times 2 \times 3 \times 3 \quad 2 \times 2 \times 2 \times 2 \times 2 \times 3$$

Maximum times of 2 occur is 5.

Maximum times of 3 occur is 2.

$$\text{L.C.M.} = 288$$

(v) 288, 96, 192

2	288
2	144
2	72
2	36
2	18
2	9
3	3
	1

3	96
2	32
2	16
2	8
2	4
2	2
	1

2	192
3	96
2	32
2	16
2	8
2	4
2	2
	1

$$2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \quad 3 \times 2 \times 2 \times 2 \times 2 \times 2 \quad 2 \times 3 \times 2 \times 2 \times 2 \times 2 \times 2$$

Maximum times of 2 occur is 6.

Maximum times of 3 occur is 2.

$$\text{L.C.M.} = 576$$

2. (i) 56, 84

2	84, 56	$2 \times 2 \times 3 \times 7 \times 2$ L.C.M. = 168
2	42, 28	
3	21, 14	
7	7, 14	
2	1, 2	
	1, 0	

(ii) 60, 96, 108

2	108, 96, 60
2	54, 48, 30
3	27, 24, 15
3	9, 8, 5
3	3, 8, 5
2	1, 8, 5
2	1, 4, 5
2	1, 2, 5
5	1, 1, 5
	1, 1, 1

$$= 2 \times 2 \times 3 \times 3 \times 3 \times 2 \times 2 \times 2 \times 5$$

$$= 4,320$$

(iii) 168, 360, 432

2	168, 360, 432
2	84, 180, 216
2	42, 90, 108
3	21, 45, 45
3	7, 15, 18
7	7, 5, 6
5	1, 5, 6
3	1, 1, 6
2	1, 1, 2
	1, 1, 1

$$2 \times 2 \times 2 \times 3 \times 3 \times 7 \times 5 \times 3 \times 2 = 15120$$

(iv) 480, 960, 720

2	480, 720, 960
2	240, 360, 480
2	120, 180, 240
3	60, 90, 120
2	20, 30, 40
2	10, 15, 20
5	5, 15, 10
3	1, 3, 2
2	1, 1, 2
	1, 1, 1

$$2 \times 2 \times 2 \times 3 \times 2 \times 2 \times 5 \times 3 \times 2$$

$$= 2880$$

3. The shortest natural number will be 1 cm.

7	77,	40,	28,	16
11	11,	40,	4,	16
4	1,	40,	4,	16
2	1,	10,	1,	4
5	1,	5,	1,	2
2	1,	1,	1,	2
	1,	1,	1,	1

$$7 \times 11 \times 4 \times 2 \times 5 \times 2 = 6160$$

As 8 be remainder so it has to be $= 6160 + 8 = 6168$

4. To make it an exact number of rupees there should be 100 paise and 335 paise. So, L.C.M.

2	100,	535
11	50,	535
	10,	107

$$\begin{aligned} \text{L.C.M.} &= 10 \times 10 \times 107 \\ &= 10700 \text{ paise} \end{aligned}$$

$$\begin{aligned} \text{The number of days} &= \frac{10700}{535} \\ &= 20 \text{ days} \end{aligned}$$

5. The nearest number must be divisible by its L.C.M.

2	8,	5,	21
2	4,	5,	21
	2,	5,	21

$$\text{L.C.M.} = 8 \times 5 \times 21 = 840$$

$$\begin{array}{r}
 840 \overline{) 100000} \quad 119 \\
 \underline{840} \\
 1600 \\
 \underline{840} \\
 7600 \\
 \underline{7560} \\
 40
 \end{array}$$

∴ Number nearest to 10,000 divisible by 840 are

$$100000 + (840 - 40) = 100800$$

6. The greatest number will be there L.C.M.

3	36,	15,	24
2	12,	5,	8
2	6,	5,	4
	3,	5,	2

$$\text{L.C.M.} = 3 \times 2 \times 2 \times 3 \times 5 \times 2 = 360$$

The greatest 6-digit number 999999 is also divisible by its L.C.M.

$$\begin{array}{r}
 360 \overline{) 999999} \quad 2777 \\
 \underline{720} \\
 2799 \\
 \underline{2520} \\
 2799 \\
 \underline{2520} \\
 2799 \\
 \underline{2520} \\
 279
 \end{array}$$

Then the greatest number exactly divisible will be

$$= 999999 - 279 = 999720$$

7.

5	15	20	30
2	3	4	6
2	3	2	3
3	3	1	3
	1	1	1

L.C.M. = $5 \times 2 \times 2 \times 3 = 60$ min or 1 hour

So, All chimed together at $10 + 1 = 11$ am

8.

2	4	7	12	84
2	2	7	6	42
7	1	7	3	21
3	1	1	3	3
	1	1	1	1

L.C.M. = $2 \times 2 \times 7 \times 3 = 84$ seconds or 1 minute 24 seconds

The time is to be = 5 : 01 : 24

and after 14 minutes

$$\frac{14 \times 60}{84} = 10$$

and it rang in beginning, so

$$= 10 + 1$$

$$= 11 \text{ times}$$

9. H.C.F. = 13

L.C.M. = 1989

a, b are the two number in which a = 117

$$117 \times b = 13 \times 1989$$

$$b = \frac{13 \times 1989}{117}$$

$$b = 221$$

10. H.C.F. = 744

$$a = 2232$$

$$b = 2976$$

$$\begin{aligned} \text{L.C.M.} &= \frac{a \times b}{\text{H.C.F.}} \\ &= \frac{2232 \times 2976}{744} \\ &= \frac{6642432}{744} \end{aligned}$$

$$\text{L.C.M.} = 8928$$

$$11. a \times b = 2160$$

$$\text{H.C.F.} = 12$$

$$\begin{aligned} \text{L.C.M.} &= \frac{a \times b}{\text{H.C.F.}} \\ &= \frac{2160}{12} \end{aligned}$$

$$\text{L.C.M.} = 180$$

12. The distance they step again is there L.C.M.

5	85	90	80
2	17	18	16
	17	9	8

$$\begin{aligned} \text{L.C.M.} &= 5 \times 2 \times 17 \times 9 \times 8 \\ &= 12240 \text{ cm} \\ &= 122 \text{ m } 40 \text{ cm} \end{aligned}$$

Check Your Mental Maths IQ

- 9
- 2
- False
- 4 prime no from smallest term are 1, 2, 3, 5 and multiply $1 \times 2 \times 3 \times 5 = 30$.

So, 30 is the smallest prime number having four different prime numbers.

5. Multiple of $5 \times 2 \times 3 = 30$ is the least number.

6. $12 = 1, 2, 3, 2$

7. The number between 90 to 96.

9. L.C.M. of 3, 5, 12, 3, 5, 21

3	3	5	12
2	1	5	4
2	1	5	2
5	1	5	1
	1	1	1

3	3	5	21
5	1	5	7
7	1	1	7
	1	1	1

$$3 \times 2 \times 2 \times 5$$

$$3 \times 7 \times 5$$

There is a difference of 7, 2, 2

$$\begin{aligned} \text{So the fourth number} &= 7 \times 2 \times 2 \\ &= 28 \end{aligned}$$

9. (iii), (v), (viii), (ix)

Multiple Choice Questions

1. (i) 61809

$$\text{Odd digit sum : } 6 + 8 + 9 = 23$$

$$\text{even digit sum} = 1$$

$$\text{difference} = 23 - 1 = 22$$

Which is divisible by 11

So, (i)

2. (ii) 5, 7

3. $a \times b = 2160$

$$\text{H.C.F.} = 12$$

$$\begin{aligned}\text{L.C.M.} &= \frac{a \times b}{\text{H.C.F.}} \\ &= \frac{2160}{12} \\ &= 180\end{aligned}$$

(ii) 180

4. (ii) 117

5. *3016

Sum of digits = $* + 3 + 1 + 6 = 10 + *$

The * is 2 or 3

So, (ii) 2

6. H.C.F. of two consecutive number like 1, 2; 2, 3 etc. is always 1. So (i) 1

7. H.C.F. of two even consecutive number is 2 as they are divisible by 2.

8. 8

H.C.F. of two consecutive odd number is 1.

Exercise 3A

1. (i) 1 (ii) 0
2. (i) $0 + 1 = 1$ (ii) $999 + 1 = 1000$
 (iii) $40900 + 1 = 40901$ (iv) $39999 + 1 = 40000$
 (v) $13550500 + 1 = 13550501$
3. (i) $15600 - 1 = 15599$ (ii) $10000 - 1 = 9999$
 (iii) $185999 - 1 = 185998$ (iv) $5006000 - 1 = 5005999$
 (v) $9999999 - 1 = 9999998$
4. 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50,
 Total '19' number between 21 and 51.
5. (i) $76 = 76$ (ii) $840 > 804$ (iii) $7285 < 7528$
 (iv) $10001 < 100001$ (v) $2168809 > 1628908$
6. $8520008 - 1 = 8520007$
 $8520007 - 1 = 8520006$
 $8520006 - 1 = 8520005$

Exercise 3B

1. (i) $137 + 419 = 479 + \underline{137}$ (commutative property)
 (ii) $945 + 385 = \underline{385} + 945$ (commutative property)
 (iii) $749 + 0 = 749$ (Additive property)
 (iv) $0 + 107 = 107$ (Additive property)
 (v) $48 + (105 + 123) = (148 + 105) + 23$ (Assosiative property)
2. $785 + 607 = 1392$
 $607 + 785 = 1392$
 (ii) $146 + 52 + 83 = 281$

$$83 + 52 + 146 = 281$$

$$(iii) \quad 2756 + 7213 = 9969$$

$$7213 + 2756 = 9969$$

$$3. \quad 345 + (679 + 321) = 345 + 1000 = 1345$$

$$(345 + 679) + 321 = 1024 + 321 = 1345$$

Yes, they are equal and satisfy associative property.

$$4. \quad (i) \quad (563 + 605) + 237 = 1405$$

$$(ii) \quad (14 + 35) + (86 + 15)$$

$$(14 + 15) + (35 + 86) \text{ or } (86 + 14) + (50) = 150$$

$$(iii) \quad (438 + 382) + (562 + 268)$$

$$(268 + 382) + (438 + 562)$$

$$= 1650$$

$$(iv) \quad (2 + 3 + 4 + 5) + (35 + 36 + 37 + 38)$$

$$= 40 + 40 + 40 + 40$$

$$= 160$$

$$5. \quad (i) \quad 468 + 9$$

$$468 + 10 - 1$$

$$478 - 1 = 477$$

$$(ii) \quad 548 + 99$$

$$548 + 100 - 1$$

$$648 - 1 = 647$$

$$(iii) \quad 2795 + 999$$

$$2795 + 1000 - 1$$

$$3795 - 1 = 3794$$

$$6. \quad (i) \quad \text{Column-wise sum} = (2 + 7 + 6 = 15)$$

$$\text{Row wise sum} = (2 + 9 + a) = 15$$

$$a = 15 - 9 - 2 = 4$$

$$\text{Column-wise sum} = (9 + b) + 1 = 15$$

$$b = 15 - 10$$

$$b = 5$$

2	9	a
7	b	c
6	1	8

$$\text{Row-wise sum} = 7 + b + c = 15$$

$$= 7 + 5 + c = 15 \Rightarrow c = 15 - 12 = 3$$

$$c = 3$$

4, 5, 3

(ii) Diagonal wise sum $= 8 + 5 + 2 = 15$

$$\text{Row wise sum} = 8 + 1 + a = 15$$

$$a = 6$$

$$\text{Column wise sum} = 1 + 5 + e = 15$$

$$e = 9$$

$$= 6 + c + 2 = 15$$

$$c = 8$$

8	1	a
b	5	c
d	e	2

$$\text{row wise sum} = b + 5 + c = 15$$

$$= b + 15 - 5 - 8$$

$$b = 2$$

$$= d + e + 2 = 15$$

$$d = 15 - 11$$

$$d = 4$$

6, 8, 2, 4

(iii)

2	15	16	a
9	12	b	c
d	e	7	10
14	f	g	17

$$\text{Diagonal wise sum} = 2 + 12 + 7 + 17 = 38$$

$$\text{Row wise sum} = 2 + 15 + 16 + a = 38$$

$$a = 5$$

$$\text{Column wise sum} = 2 + 9 + d + 14 = 38$$

$$d = 13$$

$$\text{Row wise sum} = 13 + e + 7 + 10 = 38$$

$$e = 8$$

$$\text{Column wise sum} = 15 + 12 + 8 + f = 38$$

$$f = 3$$

$$\Rightarrow 5 + c + 10 + 17 = 38$$

$$c = 6$$

$$\text{Column wise sum} = 14 + 3 + g + 17 = 38$$

$$g = 4$$

$$\text{Row wise sum} = 16 + 7 + b = 38$$

$$b = 11$$

$$5, 11, 6, 14, 8, 3, 4$$

Exercise 3C

1. (i) $7839 - 983 = 6856$

Checking: $983 + 6856 = 7839$

(ii) $32507 - 10869 = 21638$

Checking: $21638 + 10869 = 32507$

(iii) $500000 - 79879 = 420121$

Checking: $79879 + 420121 = 500000$

2. (i)
$$\begin{array}{r} 5\ 7\ 6 \\ -\ * \ 4\ 9 \\ \hline 2\ * \ * \end{array}$$

$$\begin{array}{r} 5\ 7\ 6 \\ -\ 3\ 4\ 9 \\ \hline 2\ 2\ 7 \end{array}$$

$$16 - 9 = 7$$

$$6 - 4 = 2$$

$$5 - * = 2, \quad 5 - 2 = 3$$

(ii)
$$\begin{array}{r} 1\ 0\ 0\ 0\ 0\ 0 \\ -\ \quad * \ * \ * \ 1 \\ \hline \quad * \ 3\ 2\ 0 \ * \end{array}$$

$$\begin{array}{r} 1\ 0\ 0\ 0\ 0\ 0 \\ -\ \quad 6\ 7\ 9\ 1 \\ \hline \quad 9\ 3\ 2\ 0\ 9 \end{array}$$

$$10 - 1 = 9$$

$$9 - 0 = 9$$

$$9 - 2 = 7$$

$$9 - 3 = 6$$

$$\begin{array}{r}
 \text{(iii)} \quad 4 \ 0 \ 0 \ 1 \ 0 \ 0 \ 2 \\
 - \quad * \ * \ 5 \ 8 \ 7 \ 6 \\
 \hline
 3 \ 7 \ 3 \ * \ * \ * \ *
 \end{array}$$

$$12 - 6 = 6$$

$$9 - 7 = 2$$

$$9 - 8 = 1$$

$$10 - 5 = 5$$

$$9 - 3 = 6$$

$$9 - 7 = 2$$

$$\begin{array}{r}
 4 \ 0 \ 0 \ 1 \ 0 \ 0 \ 2 \\
 - \quad 2 \ 6 \ 5 \ 8 \ 7 \ 6 \\
 \hline
 3 \ 7 \ 3 \ 5 \ 1 \ 2 \ 6
 \end{array}$$

3. Smallest 7-digit number = 1000000

$$\begin{array}{r}
 \text{Largest 6-digit number} = 999999 \\
 \hline
 1
 \end{array}$$

1 Ans.

4. Money left in his account is deposited – withdrew.

$$\begin{array}{r}
 1 \ 7 \ 2 \ 8 \ 7 \\
 - 6 \ 0 \ 8 \ 8 \\
 \hline
 1 \ 1 \ 1 \ 9 \ 9
 \end{array}$$

₹ 111999 is left in his account.

5. Satyam has ₹ = 51,000

$$\text{He gave to Abinav} = 7650$$

$$\text{He gave to Kruti} = 11527$$

$$\text{He gave to Manu} = 25000$$

$$\begin{array}{r}
 \text{Total giving} = 44177 \\
 \hline
 \end{array}$$

$$\text{He left} = 51000$$

$$- 44177$$

$$\begin{array}{r}
 \hline
 ₹ \ 6823
 \end{array}$$

6. Population of village = 7500

$$\text{Men} = 2489$$

$$\text{Women} = + 1865$$

$$\begin{array}{r}
 \text{Total} = 4354 \\
 \hline
 \end{array}$$

Number of children = 3146

1. (i) $287 \times 0 = 0$ (ii) $3456 \times 1 = 3456$
(iii) $364 \times 127 = 127 \times \underline{364}$ (Commutative Property)
(iv) $\underline{1234} \times 7864 = 7864 \times 1234$ (Commutative Property)
(v) $10 \times 100 \times \underline{10} = 10000$
(vi) $16 \times 17 = 16 \times 8 + 16 \times \underline{5} + 16 \times 4$
(vii) $14 \times 55 = 14 \times 60 - 14 \times \underline{5}$
(viii) $56 \times 75 = 56 \times 80 - 56 \times \underline{4} - 56$
2. (i) Commutative property
(ii) Closure property
(iii) Associative property
(iv) Existence of multiplication identity
(v) Multiplicative property of 0
(vi) Distributive property of multiplication over addition
(vii) Distributive property of multiplication over subtraction.
3. (i) $25 \times 4 \times 1528 = (25 \times 4) \times 1528$
 $= 100 \times 1528$
 $= 152800$
(ii) $250 \times 125 \times 8 \times 4$
 $(250 \times 4) \times (125 \times 8)$
 $1000 \times 1000 = 2000000$
(iii) $16 \times 49 \times 25$
 $(16 \times 25) \times 49$
 $(400) \times 49 = 19600$
(iv) $4 \times 16 \times 50 \times 9$
 $(50 \times 16) \times (4 \times 9)$

$$(800) \times 36 = 28,800$$

$$(v) \quad 1729 \times 482 \times 0 \times 18 \\ = 0$$

$$(vi) \quad 625 \times 20 \times 8 \times 50 \\ (625 \times 8) \times (20 \times 50) \\ (5,000) \times (1000) = 5000000$$

$$4. \quad (i) \quad 927 \times 475 = 440325$$

$$(ii) \quad 3014 \times 627 = 1889778$$

$$(iii) \quad 12532 \times 2059 = 25803388$$

$$5. \quad (i) \quad 736 \times 103$$

$$736 \times (100 + 3) \text{ (apply distributive property we get)} \\ = (736 \times 100) + (736 \times 3) = 75808$$

$$(ii) \quad 947 \times 96$$

$$947 \times (100 - 4)$$

Apply distributive property we get

$$(947 \times 100) - (947 \times 4) = 90912$$

$$(iii) \quad 996 \times 256$$

$$(1000 - 4) \times 256$$

$$(256000) - (4 \times 256) = 254976$$

$$(iv) \quad 1001 \times 98$$

$$(1000 + 1) \times 98$$

$$98000 + 98 = 98098$$

$$(v) \quad 265 \times (1000 + 7)$$

$$265000 + (256 \times 7) = 266855$$

$$(vi) \quad 463 \times (200 - 2)$$

$$91674$$

$$6. \quad (i) \quad 65 \times 75 + 35 \times 75$$

$$75 (65 + 35)$$

$$75 (100) = 7500$$

$$(ii) \quad 54 \times 331 + 54 \times 169$$

$$54(331 + 169)$$

$$54(500) = 27000$$

$$(iii) \quad 735 \times 105$$

$$735(100 + 5)$$

$$73500 + 735 \times 5$$

$$73500 + 3675 = 77175$$

$$(iv) \quad 165 \times 97$$

$$165(100 - 3)$$

$$165 \times 100 - 165 \times 3$$

$$16500 - 495 = 16005$$

$$(v) \quad 631 \times 10 \times 467 - 367 \times 6310$$

$$6310(467 - 367)$$

$$6310 \times 100 = 631000$$

$$7. \text{ Largest 3-digit number} = 999$$

$$\text{Largest 4-digit number} = 9999$$

Product is

$$999 \times 9999$$

$$999 \times (10000 - 1)$$

$$9990000 - 999 = 9989001$$

$$8. \text{ 1 colour T.V. cost} = ₹ 10350$$

$$\text{So, 125 Colour TV cost} = 125 \times 10350$$

$$= 125 \times (10000 + 350)$$

$$= 1250000 + 43750 = ₹ 1293750$$

$$9. \text{ Either one or both numbers must be zero.}$$

$$\text{Anything} \times 0 = 0$$

$$10. \text{ 1 chair cost } ₹ 165$$

$$50 \text{ chair cost} = ₹ 165 \times 50$$

$$1 \text{ table cost} = 445$$

$$30 \text{ tables cost} = 445 \times 30$$

$$\text{Total amount of the bill is} = 165 \times 50 + 445 \times 30$$

$$= ₹ 21600$$

Exercise 3E

1. (i) $5805 \div 25$

$$\begin{array}{r} 25 \overline{) 5805} \quad 232 \\ \underline{50} \\ 80 \\ \underline{75} \\ 55 \\ \underline{50} \\ 5 \\ \underline{5} \\ 0 \end{array}$$

$$\text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$$

$$\begin{aligned} 5805 &= 25 \times 232 + 5 \\ &= 5800 + 5 \\ &= 5805 \end{aligned}$$

(ii)

$$\begin{array}{r} 56 \overline{) 17245} \quad 307 \\ \underline{168} \\ 445 \\ \underline{392} \\ 53 \\ \underline{53} \\ 0 \end{array}$$

$$\text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$$

$$\begin{aligned} 17245 &= 56 \times 307 + 53 \\ &= 17245 \end{aligned}$$

(iii)

$$\begin{array}{r} 1000 \overline{) 23025} \quad 23 \\ \underline{2000} \\ 3025 \\ \underline{3000} \\ 25 \\ \underline{25} \\ 0 \end{array}$$

$$\begin{aligned}
 \text{Dividend} &= \text{Divisor} \times \text{Quotient} + \text{Remainder} \\
 &= 1000 \times 23 + 25 \\
 &= 23000 + 25 \\
 &= 23025
 \end{aligned}$$

2. (i) $38261 \div 1 = 38261$

(ii) $0 \div 678 = 0$

(iii) $630 \div 63 - 10$

$$10 - 10 = 0$$

(iv) $999 + 635 \div 635$

$$999 + 1 = 1000$$

(v) $60 \times 101 - 360 \div 6$

$$60 \times 101 - 60$$

$$= 60(101 - 1) = 6000$$

(vi) $964 - (425 \div 425)$

$$964 - 1 = 963$$

(vii) $(40 \times 80) - 1600 \div 200$

$$3200 - (1600 \div 200)$$

$$3200 - 8 = 3192$$

3. yes

and it is 1

$$1 \div 1 = 1$$

4. $\text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$

$$= 36 \times 12 + 15 = 447$$

5. $\text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$

$$40500 = 175 \times \text{Quotient} + 75$$

$$40425 = 175 \times \text{Quotient}$$

$$\frac{40425}{175} = \text{Quotient}$$

$$\text{Quotient} = 231$$

6.

$$\begin{array}{r}
 35 \overline{) 1200} \quad 34 \\
 \underline{105} \\
 150 \\
 \underline{140} \\
 10
 \end{array}$$

$$\begin{aligned}
 \text{Dividend} &= \text{Divisor} \times \text{Quotient} + \text{Remainder} \\
 &= 35 \times 34 + 10 \\
 &= 1200
 \end{aligned}$$

But least must be added 10

to get exactly divisible, so the quotient is next 35

$$\begin{aligned}
 \text{Dividend} &= \text{Divisor} \times \text{Quotient} \\
 &= 35 \times 35 = 1225
 \end{aligned}$$

So, there is difference of $= 1225 - 1200 = 25$

7. Greatest 5-digit number $= 99999$

$$\begin{array}{r}
 115 \overline{) 99999} \quad 869 \\
 \underline{920} \\
 799 \\
 \underline{690} \\
 1099 \\
 \underline{1035} \\
 64
 \end{array}$$

As greatest number will be $(99999 - 64)$

Which is divisible by 115 $= 99935$

least 5-digit number $= 10000$

$$\begin{array}{r}
 115 \overline{) 10000} \quad 86 \\
 \underline{920} \\
 800 \\
 \underline{690} \\
 110
 \end{array}$$

So, the least number is to be $115 \times 87 = 10005$

8. Let the second number be 'a'

$$\text{So, } 32310 = 718 \times a$$

$$32310 \div 718 = a$$

$$\begin{array}{r} 718 \overline{) 32310} 45 \\ \underline{2872} \\ 3590 \\ \underline{3590} \\ \hline \times \end{array}$$

$$\text{So, } a = 45$$

9. Dividend = Divisor $\times$ Quotient + Remainder

$$59761 = \text{Divisor} \times 189 + 37$$

$$59761 - 37 = \text{Divisor} \times 189$$

$$59724 = \text{Divisor} \times 189$$

$$59724 \div 189 = \text{Divisor}$$

$$\begin{array}{r} 189 \overline{) 59724} 316 \\ \underline{567} \\ 302 \\ \underline{189} \\ 1134 \\ \underline{1134} \\ \hline \times \end{array}$$

$$\text{So, Divisor} = 316$$

10. 1 out 15 of total population is uneducated means

$$10725 \div 15 \quad \begin{array}{r} 15 \overline{) 10725} 715 \\ \underline{105} \\ 22 \\ \underline{15} \\ 75 \\ \underline{75} \\ \hline \times \end{array}$$

So, 715 people were uneducated,

So, educated persons will be

$$= 10725 - 715 = 10010$$

11. Total number of tree = 19625

Number of row = 157

Plant in each row = $19625 \div 157$

$$\begin{array}{r} 157 \overline{) 19625} 125 \\ \underline{157} \\ 392 \\ \underline{314} \\ 785 \\ \underline{785} \\ \times \end{array}$$

So, 125 tree in each row.

Check Your Mental Math IQ

1. 0

2. $a = 3, b = 6$

$$a - b = 6 - 3 = 3$$

$b - a \neq 3 - 6 \neq$ is not a whole number

So, $a - b \neq b - a$

3. (i) $477 + 630 + 523$

$$(477 + 523) + 630$$

$$1000 + 630 = 1630$$

(ii) $62 + 697 + 38 + 303$

$$(62 + 38) + (697 + 303)$$

$$100 + 1000 = 1100$$

4. Subtraction and division.

5. 0

6. Addition and multiplication

- | | | |
|-------------|--------------|-------------|
| 7. (i) true | (ii) false | (iii) true |
| (iv) true | (v) false | (vi) false |
| (vii) true | (viii) false | (ix) true |
| (x) true | (xi) false | (xii) false |
| (xiii) true | (xiv) false | (xv) true |
| (xvi) false | | |

Multiple Choice Questions

- (ii) 0
- (ii) 1
- (ii) Multiplication
- Largest two digit = 99
Smallest three digit = 100
Difference = $100 - 99 = 1$
So (ii) 1
- (ii) 1
- $430 \times 8 + 430 \times 2$
 $430(8 + 2) = 4300$
(i) 4300
- $15 \times 12 = 180$ (iv)
- Dividend = Divisor $\times$ Quotient + Remainder
 $= 208 \times 7 + 35 = 1491$
(iii) 1491
- Subtrahend = -1068 ; minuend = 105
Difference = $105 - (-1068) = 1173$
(i) 1173
- (iii) $a \times (b \times c) = (a \times b) \times c$

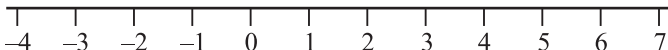
4

Negative Numbers and Integers

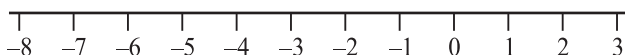
Exercise 4A

1. (i) A fall of 40 points. (ii) A gain of ₹ 100.
 (iii) A withdrawal of ₹ 2000 (iv) Spending ₹ 500
 (v) Gaining of a weight 5kg (vi) spending money.
2. (i) -2 km (ii) $+5\text{ km}$
 (iii) 10 kg (iv) -5°C
 (v) -9 (vi) $-\text{₹ } 300$

3. (i) -4 and 3
 $-3, -2, -1, 0, 1, 2$
 (ii) -2 and 6
 $-1, 0, 1, 2, 3, 4, 5$
 (iii) -5 and -1
 $-4, -3, -2$

4. (i) -3 (ii) 0 (iii) 4 (iv) 7
- 

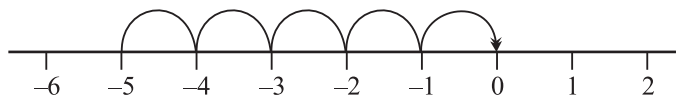
- (ii) -8



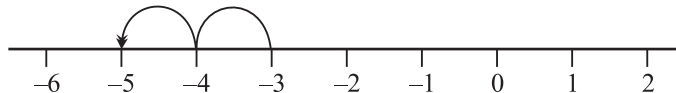
5. (i) $5 > -6$ (ii) $0 > -1$
 (iii) $-12 > -25$ (iv) $-26 < 18$
6. (i) $0 > -3$ (ii) $-2 > -4$
 (iii) $-12 > -27$ (iv) $-375 > -908$
7. (i) 3 more than 6



(ii) 5 more than -5



(iii) 2 less than -3



8. $|-3| = 3$

$|-15| = 15$

$|-4| = 4$

$|-7| = 7$

$|0| = 0$

$|4| = 4$

$|9| = 9$

9. (i) $|-8| = 8$

(ii) $|0| = 0$

(iii) $|15| = 15$

(iv) $-|-5| = -(5) = -5$

(v) $7 + |-3| = 7 + 3 = 10$

(vi) $|7 - 5| = |2| = 2$

(vii) $9 - |-5| = 9 - 5 = 4$

(viii) $|5| - |0| = 5$

Exercise 4B

1. (i) $6 + (-2) = 4$

(ii) $(-8) + 3 = 5$

(iii) $(-4) + (-5) = -9$

(iv) $(-1) + (-3) + 2 = -4 + 2 = -2$

(v) $(-3) + 8 + (-8) = -3$

2. (i) $(-2) + (-7) = -9$

(ii) $(-7) + (-9) = -16$

(iii) $(-15) + (23) = 8$

(iv) $8 + (-18) = 10$

3. (i) $\begin{array}{r} -275 \\ -86 \\ \hline -361 \end{array}$

(ii) $\begin{array}{r} -72 \\ -187 \\ \hline -259 \end{array}$

(iii) $\begin{array}{r} -2065 \\ -876 \\ \hline -2941 \end{array}$

(iv) $\begin{array}{r} -306 \\ +88 \\ \hline -218 \end{array}$

(v) $\begin{array}{r} -105 \\ +317 \\ \hline 212 \end{array}$

(vi) $\begin{array}{r} -583 \\ +279 \\ \hline -304 \end{array}$

4. (i) -36 and 127

$$\begin{array}{r} 127 \\ - 36 \\ \hline 91 \end{array}$$

(ii) 88

$$\begin{array}{r} 88 \\ - 57 \\ \hline 31 \end{array}$$

(iii) -150

$$\begin{array}{r} -150 \\ - 433 \\ \hline -583 \end{array}$$

(iv) 1547

$$\begin{array}{r} 1547 \\ - 1548 \\ \hline -1 \end{array}$$

(v) 182

$$\begin{array}{r} 182 \\ + 38 \\ \hline 220 \end{array}$$

5. (i) 54 Additive inverse $= -54$, as $54 - 54 = 0$

(ii) -186 additive inverse $= 186$

(iii) 0 ; additive inverse $= 0$

(iv) -1002 ; 1002 is additive inverse

(v) 2056 ; -2056 is additive inverse.

6. (i) $-25 + 1 = -24$

(ii) $100 + 1 = 101$

(iii) $-0 + 1 = 1$

(iv) $-1 + 1 = 0$

(v) $1 + 1 = 2$

7. (i) $-42 - 1 = -43$

(ii) $0 - 1 = -1$

(iii) $-1 - 1 = -2$

(iv) $1 - 1 = 0$

(v) $-200 - 1 = -201$

8. 50 km to east of Delhi

then 90 km to west of Delhi

$$50 - 90 = -40$$

as 40 km to west of Delhi finally.

9. At 9 am the temperature was -2°C

Nest hour at 10 am the temperature was $-2 + 5 = 3^{\circ}\text{C}$

10. (i) $x + 5 = 0$

$$x = -5$$

(ii) $-3 + x = 0$

$$x = 3$$

$$(iii) \quad x + (-6) = 0$$

$$x = 6$$

$$(iv) \quad -7 + x = 0$$

$$x = 7$$

Exercise 4C

1. (i) 15 from -6

$$-6 - 15$$

$$-(6 + 15) = -21$$

(ii) -18 from 35

$$35 - (-18)$$

$$35 - (\text{negative of } 18)$$

$$35 + 18 = 53$$

(iii) 48 from -27

$$-27 - 48$$

$$-(27 + 48) = -75$$

(iv) 109 from 0

$$0 - 109 = -109$$

(v) 1001 from 101

$$101 - 1001 = -900$$

(vi) -912 from 0

$$0 - (-912) = 912$$

2. (i) $-37 - (-25)$

$$-37 + 25 = -12$$

(ii) $-15 - 16 - (-33)$

$$-31 + 33 = 2$$

(iii) $-14 - (-7) - (-127) + 275$

$$-14 + 7 + 127 + 275 = 385$$

(iv) $35 - (-6) + 9 - (-28)$

$$35 + 6 + 9 + 28 = 78$$

3. $-105 + 81$ from -18

$$-24 \text{ from } -18$$

$$= -18 - (-24) = -18 + 24 = 6$$

4. $(236 - 172) - (-250 + 148) = 64 + 102 = 166$

5. $133 - 47 - (-184) = 86 + 184 = 270$

5. $a + b = 75$
 $a = -57$
 $b = 75 + 57 = b = 132$
7. $a + b = -27$, $a = 160$
 $b = -27 - 160 = b = -187$
8. Meerut at 9 am the temperature $= 12^{\circ}\text{C}$
 Mid night temperature $= -4^{\circ}\text{C}$
 $= 8^{\circ}\text{C}$
 Fall is $= 8^{\circ}\text{C}$
 Mumbai
 at 9am the temperature $= 16^{\circ}\text{C}$
 mid night temperature $= -8^{\circ}\text{C}$
 Fall is $= 16 - 8 = 8^{\circ}\text{C}$
 none of these
9. Top point is 4800 m above sea level
 and 12500 m below sea level
 So, vertical distance $= 4800 + 12500 = 17300$
 i.e. 17300

Check Your Mental Maths

1. Yes 2. -99 3. -7, -6, -5, -4, -3
 4. -2km 5. zero 6. Diver
 7. (i), (iv), (v), (vi), (viii), (xi), (xii), (xiii), (xv)

Multiple Choice Questions

1. (iii) north 2. (ii) always positive
 2. $4 - 4 + 4 - 4 + 4 - 4 = 0$ (i) 4. $-4 + 1 = -3$ (i) -3
 5. $-2 - 1 = -3$
 6. $|-16| - |8 - 2| = 16 - 6 = 10$ (ii) 10
 7. (i) neither negative nor positive
 8. $(-12) - (-6) = -12 + 6 = -6$ (ii) -6
 9. $a + b = -250$
 $a = 300$
 $b = -250 + (-300) = -550$
 (iii) -550
 10. (iii)

Exercise 5A

1. (i) four-fifth = $\frac{4}{5}$ (ii) Seventh ninths = $\frac{7}{9}$
 (iii) one-tenths = $\frac{1}{10}$ (iv) nine-twentieths = $\frac{9}{20}$
2. (i) Two thirds (ii) three-eighths
 (iii) nine-tenths (iv) five-twelveth
 (v) seven-sixteenth
3. (i) $\frac{3}{5}$ Numerator = 3; denominator = 5
 (ii) $\frac{5}{7}$ Numerator = 5; denominator = 7
 (iii) $\frac{9}{13}$ Numerator = 9; denominator = 13
4. (i) $\frac{3}{7}$ (ii) $\frac{5}{9}$ (iii) $\frac{7}{12}$ (iv) $\frac{8}{15}$
5. (i) $\frac{3}{4}$ of 12 balls = $\frac{3}{4} \times 12 = 9$ balls
 (ii) $\frac{3}{4} \times 20 = 15$ balls
 (iii) $\frac{3}{4} \times 32 = 24$ balls
 (iv) $\frac{3}{4} \times 36 = 27$ balls
6. 1 hour = 60 minutes

$$\text{or } 1 \text{ minute} = \frac{1}{60} \text{ hours}$$

$$15 \text{ minute} = \frac{15}{60} \text{ hours} \quad \text{or} = \frac{1}{4} \text{ hours}$$

7. Natural number from 2 to 15.

2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

Prime numbers are = 2, 3, 5, 7, 11, 13

prime number = 6

$$\text{The ratio is to be} = \frac{6}{14} \text{ or } \frac{3}{7}$$

8. $\frac{2}{3}$ of collection of 9 cups

$$\frac{2}{3} \times 9 = 6 \text{ cups}$$

9. (i) There are 24 apples

$$\text{Use } \frac{1}{4} \text{ of } 24$$

$$= \frac{1}{4} \times 24 = 6 \text{ apples}$$

$$\text{(ii) left apples} = 24 - 6 = 18$$

10. Riya has 24 bananas.

$$\text{(i) Kruti get} = \frac{1}{2} \times 24 = 12 \text{ bananas}$$

$$\text{(ii) Manu get} = \frac{1}{4} \times 24 = 6 \text{ bananas}$$

$$\text{(iii) Riya kept} = 24 - 12 - 6 = 6 \text{ bananas}$$

$$11. 1 \text{ second} = \frac{1}{60} \text{ minutes}$$

$$20 \text{ seconds} = \frac{1}{60} \times 20 = \frac{1}{3} \text{ minutes}$$

$$12. \ 1 \text{ months} = \frac{1}{12} \text{ year}$$

$$4 \text{ months} = \frac{1}{12} \times 4 = \frac{1}{3} \text{ years}$$

Exercise 5B

$$1. \quad (i) \quad \frac{1}{7} \times \frac{2}{2} = \frac{2}{14}, \quad \frac{1}{7} \times \frac{3}{3} = \frac{3}{21}, \quad \frac{1}{7} \times \frac{4}{4} = \frac{4}{28},$$

$$(ii) \quad \frac{3}{11} \times \frac{2}{2} = \frac{6}{22}, \quad \frac{3}{11} \times \frac{3}{3} = \frac{9}{33}, \quad \frac{3}{11} \times \frac{4}{4} = \frac{12}{44},$$

$$(iii) \quad \frac{5}{12} \times \frac{2}{2} = \frac{10}{24}, \quad \frac{5}{12} \times \frac{3}{3} = \frac{15}{36}, \quad \frac{5}{12} \times \frac{4}{4} = \frac{20}{48},$$

$$(iv) \quad \frac{7}{9} \times \frac{2}{2} = \frac{14}{18}, \quad \frac{7}{9} \times \frac{3}{3} = \frac{21}{27}, \quad \frac{7}{9} \times \frac{4}{4} = \frac{28}{36},$$

$$(v) \quad \frac{4}{13} \times \frac{2}{2} = \frac{8}{26}, \quad \frac{4}{13} \times \frac{3}{3} = \frac{12}{39}, \quad \frac{4}{13} \times \frac{4}{4} = \frac{16}{52},$$

$$2. \quad (i) \quad \frac{3}{7} = \frac{\square}{42}$$

$$\text{as } 42 \div 7 = 6$$

$$\text{so } \frac{3 \times 6}{7 \times 6} = \frac{18}{42}$$

$$(ii) \quad \frac{10}{22} = \frac{\square}{33} \quad \text{or} \quad \frac{5}{11} = \frac{\square}{33}$$

$$\text{as } 33 \div 11 = 3$$

$$\text{so } \frac{5 \times 3}{11 \times 3} = \frac{\boxed{15}}{33}$$

$$(iii) \quad \frac{35}{42} = \frac{5}{\square}$$

$$\frac{35 \div 7}{42 \div 7} \Rightarrow \frac{5}{6} = \frac{5}{\square}$$

$$\text{So, } \frac{5}{6} = \frac{5}{6}$$

$$(iv) \quad \frac{\square}{10} = \frac{45}{50} \quad \text{as } 50 \div 10 = 5$$

$$\frac{9}{10} = \frac{45 \div 5}{50 \div 5} \quad \text{so, } \frac{9}{10}$$

$$(v) \quad \frac{5}{8} = \frac{\square}{16} \quad \text{as } 16 \div 8 = 2$$

$$\frac{5 \times 2}{8 \times 2} = \frac{10}{16}$$

$$(vi) \quad \frac{45}{60} = \frac{15}{\square} \quad \text{as } 45 \div 3 = 15$$

$$\frac{45 \div 3}{60 \div 3} = \frac{15}{20} \quad \text{So, } \frac{15}{20}$$

$$3. \quad (i) \quad \frac{2}{3} \not\sim \frac{7}{18}$$

$$18 \times 2 = 36$$

$$7 \times 3 = 21$$

So, it is not equivalent fraction.

$$(ii) \quad \frac{6}{9} \not\sim \frac{4}{3}$$

$$6 \times 3 = 18$$

$$9 \times 4 = 36$$

So, it is not equivalent fraction.

$$(iii) \quad \frac{3}{4} \not\sim \frac{24}{32}$$

$$32 \times 3 = 96$$

$$24 \times 4 = 96$$

Yes, it is an equivalent fraction.

$$(iv) \quad \frac{21}{39} \not\sim \frac{7}{13}$$

$$21 \times 13 = 273$$

$$39 \times 7 = 273$$

Yes, it is equivalent fraction.

$$4. \quad (i) \quad \frac{1}{3} \not\sim \frac{9}{24}$$

$$24 \times 1 = 24$$

$$9 \times 3 = 27$$

$$\text{So, } \frac{1}{3} \neq \frac{9}{24}$$

$$(ii) \quad \frac{2}{3} \not\sim \frac{33}{22}$$

$$22 \times 2 = 44$$

$$3 \times 33 = 99$$

$$\text{So } \frac{2}{3} \neq \frac{33}{22}$$

$$(iii) \quad \frac{2}{9} \swarrow \nearrow \frac{14}{63}$$

$$63 \times 2 = 126$$

$$14 \times 9 = 126$$

$$\text{So, } \frac{2}{9} = \frac{14}{63}$$

$$(iv) \quad \frac{3}{8} \swarrow \nearrow \frac{15}{40}$$

$$40 \times 3 = 120$$

$$15 \times 8 = 120$$

$$\text{So } \frac{3}{8} = \frac{15}{40}$$

$$5. \quad (i) \quad \frac{3}{8} \text{ numerator } 63$$

$$63 \div 3 = 21$$

$$\text{So } \frac{3 \times 21}{8 \times 21} = \frac{63}{168}$$

$$(ii) \quad \frac{2}{9} \text{ denominator } 63$$

$$63 \div 9 = 7$$

$$\text{So } \frac{2 \times 7}{9 \times 7} = \frac{14}{63}$$

$$(iii) \quad \frac{6}{11} \text{ numerator } 42$$

$$42 \div 6 = 7$$

$$\text{So } \frac{6 \times 7}{11 \times 7} = \frac{42}{77}$$

(iv) $\frac{3}{8}$ with denominator 40

$$40 \div 8 = 5$$

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

6. (i) Lowest form of $\frac{48}{60}$

$$\text{Prime factor } 48 = 2, 2, 2, 2, 3$$

$$\text{Prime factor } 60 = 3, 2, 2, 5$$

$$\text{H.C.F.} = 2 \times 2 \times 3 = 12$$

$$\text{So, } \frac{48}{60} = \frac{48 \div 12}{60 \div 12} = \frac{4}{5}$$

(ii) $\frac{28}{42}$

$$\text{Prime factor of } 28 = 2, 2, 7$$

$$\text{Prime factor of } 42 = 2, 7, 3$$

$$\text{H.C.F.} = 2 \times 7 = 14$$

$$\text{So } \frac{28}{42} = \frac{28 \div 14}{42 \div 14} = \frac{2}{3}$$

(iii) $\frac{40}{72}$

$$\text{Prime factor of } 40 = 2, 5, 2, 2$$

$$\text{Prime factor of } 72 = 2, 2, 2, 3, 3$$

$$\text{H.C.F.} = 2 \times 2 \times 2 = 8$$

$$\text{So } \frac{40}{72} = \frac{40 \div 8}{72 \div 8} = \frac{5}{9}$$

(iv) $\frac{56}{84}$

Prime factor of $56 = 2, 2, 2, 7$

Prime factor of $84 = 2, 2, 3, 7$

$$\text{H.C.F.} = 2 \times 2 \times 7 = 28$$

$$\text{So } \frac{56}{84} = \frac{56 \div 28}{84 \div 28} = \frac{2}{3}$$

$$(v) \frac{46}{69}$$

Prime factor $46 = 2, 23$

Prime factor $69 = 3, 23$

$$\text{H.C.F.} = 23$$

$$\text{So } \frac{46}{69} = \frac{46 \div 23}{69 \div 23} = \frac{2}{3}$$

$$7. \quad (i) \frac{9}{15}$$

Prime factor of $9 = 3 \times 3$

Prime factor of $15 = 3 \times 5$

$$\text{So, H.C.F.} = 3$$

$$\text{So } \frac{9}{15} = \frac{9 \div 3}{15 \div 3} = \frac{3}{5}$$

$$(ii) \frac{18}{24}$$

Prime factor of $18 = 3 \times 3 \times 2$

Prime factor of $24 = 2 \times 3 \times 2 \times 2$

$$\text{So, H.C.F.} = 3 \times 2 = 6$$

$$\text{So } \frac{18}{24} = \frac{18 \div 6}{24 \div 6} = \frac{3}{4}$$

$$(iii) \frac{19}{108}$$

Prime factor of 19 is 19

Prime factor of 108 is 108

So, L.C.M. = 19×108

It cannot change.

(iv) $\frac{84}{98}$

Prime factor of $84 = 2 \times 2 \times 3 \times 7$

Prime factor of $98 = 2 \times 7 \times 7$

So, H.C.F. = $2 \times 7 = 14$

So $\frac{84}{98} = \frac{84 \div 14}{98 \div 14} = \frac{6}{7}$

(v) $\frac{28}{49}$

Prime factor of $28 = 2 \times 2 \times 7$

Prime factor of $49 = 7 \times 7$

So, H.C.F. = 7

So $\frac{28}{49} = \frac{28 \div 7}{49 \div 7} = \frac{4}{7}$

8. (i) $\frac{56}{84}$

Prime factor of $56 = 2 \times 2 \times 2 \times 7$

Prime factor of $84 = 2 \times 2 \times 7 \times 3$

So, H.C.F. = $2 \times 2 \times 7 = 28$

So $\frac{56}{84} = \frac{56 \div 28}{84 \div 28} = \frac{2}{3}$

(ii) $\frac{126}{210}$

Prime factor of $126 = 2 \times 3 \times 3 \times 7$

Prime factor of $210 = 2 \times 5 \times 3 \times 7$

So, H.C.F. $= 2 \times 3 \times 7 = 42$

$$\frac{126 \div 42}{210 \div 42} = \frac{3}{5} \quad (\text{d}) \frac{3}{5}$$

$$(iii) \frac{75}{300}$$

Prime factor of $75 = 5 \times 5 \times 3$

Prime factor of $300 = 5 \times 3 \times 2 \times 5 \times 2$

So, H.C.F. $= 5 \times 5 \times 3 = 75$

$$\text{So } \frac{75}{300} = \frac{75 \div 75}{300 \div 75} = \frac{1}{4} \quad (\text{a}) \frac{1}{4}$$

$$(iv) \frac{175}{300} = \frac{7}{20} (b)$$

Exercise 5C

$$1. \frac{1}{3}, \frac{3}{4}, \frac{16}{21}, \frac{10}{13}$$

$$2. \frac{5}{4}, \frac{7}{3}, \frac{15}{7}, 4, \frac{25}{12}, \frac{17}{16}$$

$$3. (i) 3\frac{2}{5} = \frac{3 \times 5 + 2}{5} = \frac{17}{5}$$

$$(ii) 5\frac{3}{7} = \frac{7 \times 5 + 3}{7} = \frac{38}{7}$$

$$(iii) 6\frac{3}{9} = \frac{9 \times 6 + 3}{9} = \frac{57}{9}$$

$$(iv) 5\frac{5}{8} = \frac{5 \times 8 + 5}{8} = \frac{45}{8}$$

$$(v) 6\frac{5}{8} = \frac{6 \times 8 + 5}{8} = \frac{53}{8}$$

$$4. \quad (i) \quad \frac{40}{7} = 5\frac{5}{7}$$

$$\begin{array}{r} 7 \overline{) 40} 5 \\ \underline{35} \\ 5 \end{array}$$

$$(ii) \quad \frac{75}{8} = 9\frac{3}{8}$$

$$\begin{array}{r} 8 \overline{) 75} 9 \\ \underline{72} \\ 3 \end{array}$$

$$(iii) \quad \frac{63}{10} = 6\frac{3}{10}$$

$$\begin{array}{r} 10 \overline{) 63} 6 \\ \underline{60} \\ 3 \end{array}$$

$$(iv) \quad \frac{38}{11} = 3\frac{5}{11}$$

$$\begin{array}{r} 11 \overline{) 38} 3 \\ \underline{33} \\ 5 \end{array}$$

$$(v) \quad \frac{101}{12} = 8\frac{5}{12}$$

$$\begin{array}{r} 12 \overline{) 101} 8 \\ \underline{96} \\ 5 \end{array}$$

$$5. \quad (i) \quad \frac{6}{7} > \frac{6}{11}$$

$$(ii) \quad \frac{11}{15} > \frac{8}{15}$$

$$(iii) \quad \frac{5}{8} > \frac{7}{12} \quad \left(\frac{15 > 14}{24} \right)$$

$$(iv) \quad \frac{4}{9} < \frac{5}{6}$$

$$(v) \quad \frac{4}{5} > \frac{7}{10}$$

$$(vi) \quad \frac{9}{10} > \frac{7}{8}$$

$$6. \quad (i) \quad \frac{5}{6} > \frac{3}{8} \quad \left(\frac{20 > 9}{24} \right)$$

$$(ii) \quad \frac{6}{7} > \frac{7}{11}$$

$$(iii) \frac{5}{8} > \frac{5}{12}$$

$$(iv) \frac{5}{6} > \frac{3}{4}$$

$$(v) \frac{4}{5} > \frac{5}{7}$$

$$(vi) \frac{5}{7} > \frac{7}{13}$$

$$7. (i) \frac{3}{4}, \frac{3}{5}, \frac{1}{2}, \frac{2}{5}$$

$$(ii) \frac{3}{4}, \frac{3}{6}, \frac{3}{8}, \frac{3}{12}$$

$$(iii) \frac{11}{15}, \frac{7}{10}, \frac{2}{3}, \frac{17}{30}$$

$$(iv) \frac{9}{10}, \frac{8}{9}, \frac{13}{18}, \frac{7}{15}$$

$$8. (i) \frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8}$$

$$(ii) \frac{11}{16}, \frac{23}{32}, \frac{3}{4}, \frac{7}{8}$$

$$(iii) \frac{3}{8}, \frac{2}{5}, \frac{12}{24}, \frac{8}{12}$$

$$(iv) \frac{3}{12}, \frac{1}{3}, \frac{5}{9}, \frac{9}{15}$$

Exercise 5D

$$1. (i) \frac{5}{9} + \frac{3}{9} = \frac{5+3}{9} = \frac{8}{9}$$

$$(ii) \frac{3}{13} + \frac{6}{13} = \frac{3+6}{13} = \frac{9}{13}$$

$$(iii) \frac{3}{16} + \frac{9}{16} = \frac{3+9}{16} = \frac{12}{16} \text{ or } \frac{3}{4}$$

$$(iv) \frac{1}{5} + \frac{1}{10} = \frac{2+1}{10} = \frac{3}{10}$$

$$\begin{array}{r|l} 5 & 10, 5 \\ \hline 2 & 5, 1 \end{array}$$

L.C.M. = 10

$$(v) \frac{2}{3} + \frac{5}{18} = \frac{2 \times 6 + 5}{18} = \frac{17}{18}$$

$$\begin{array}{r|l} 3 & 3, 18 \\ \hline 3 & 1, 6 \end{array}$$

L.C.M. = 18

$$(vi) \frac{3}{8} + \frac{5}{12} = \frac{9+10}{24} = \frac{19}{24}$$

$$\begin{array}{r|l} 2 & 12, 8 \\ \hline 2 & 6, 4 \end{array}$$

L.C.M. = 24

$$(vii) \frac{2}{9} + \frac{3}{9} + \frac{1}{18} = \frac{2 \times 2 + 3 \times 2 + 1}{18} = \frac{11}{18}$$

$$\begin{array}{r|l} 3 & 9, 9, 18 \\ \hline 3 & 3, 3, 6 \end{array}$$

L.C.M. = $3 \times 3 \times 2 = 18$

$$\begin{array}{r|l} & 1, 1, 2 \end{array}$$

$$2. \quad (i) \quad \frac{6}{9} - \frac{2}{9} = \frac{6-2}{9} = \frac{4}{9}$$

$$(ii) \quad \frac{8}{17} - \frac{1}{17} = \frac{7}{17}$$

$$(iii) \quad \frac{3}{4} - \frac{1}{3} = \frac{3 \times 3 - 4}{12} = \frac{5}{12} \quad \begin{array}{c|c} 3 & 4, 3 \\ \hline & 4, 1 \end{array} \quad 3 \times 4 = 12$$

$$(iv) \quad \frac{17}{18} - \frac{5}{12} = \frac{17 \times 2 - 5 \times 3}{36} = \frac{34 - 15}{36} = \frac{19}{36} \quad \begin{array}{c|c} 2 & 18, 12 \\ \hline 3 & 9, 6 \\ \hline 3 & 3, 2 \\ \hline & 1, 2 \end{array}$$

L.C.M. = 36

$$(v) \quad \frac{8}{15} - \frac{7}{20} = \frac{8 \times 4 - 7 \times 3}{60} = \frac{32 - 21}{60} = \frac{11}{60} \quad \begin{array}{c|c} 5 & 15, 20 \\ \hline & 3, 4 \end{array}$$

L.C.M. = $3 \times 4 \times 5 = 60$

$$(vi) \quad \frac{5}{9} - \frac{1}{6} = \frac{5 \times 2 - 1 \times 3}{18} = \frac{10 - 3}{18} = \frac{7}{18} \quad \begin{array}{c|c} 3 & 9, 6 \\ \hline 3 & 3, 2 \\ \hline & 1, 2 \end{array}$$

L.C.M. = $3 \times 3 \times 2 = 18$

$$(vii) \quad 6\frac{1}{3} - 3\frac{2}{9} = \frac{6 \times 3 + 1}{3} - \frac{3 \times 9 + 2}{9} \quad \begin{array}{c|c} 3 & 3, 9 \\ \hline 3 & 1, 3 \\ \hline & 1 \end{array}$$

$$\frac{19}{3} - \frac{29}{9} = \frac{19 \times 3 - 29}{9} \Rightarrow \frac{57 - 29}{9} = \frac{28}{9}$$

$$(viii) \quad 6\frac{1}{6} - 2\frac{3}{4} = \frac{6 \times 6 + 1}{6} - \frac{2 \times 4 + 3}{4}$$

$$\frac{37}{6} - \frac{11}{4} \Rightarrow \frac{37 \times 2 - 11 \times 3}{12} \Rightarrow \frac{74 - 33}{12} = \frac{41}{12}$$

$$(ix) \quad 3\frac{3}{8} - 2\frac{7}{12} = \frac{8 \times 3 + 3}{8} - \frac{2 \times 12 + 7}{12}$$

$$\frac{27}{8} - \frac{31}{12} \Rightarrow \frac{27 \times 3 - 31 \times 2}{24} \Rightarrow \frac{81 - 62}{24} = \frac{19}{24}$$

$$3. \quad (i) \quad \frac{5}{6} - \frac{4}{9} + \frac{2}{3}$$

$$= \frac{5 \times 3 - 4 \times 2 + 2 \times 6}{18} = \frac{15 - 8 + 12}{18} = \frac{19}{18}$$

$$(ii) 3 + \frac{11}{15} - \frac{5}{9}$$

$$= \frac{3 \times 15 + 11 \times 3 - 5 \times 5}{45} = \frac{135 + 33 - 25}{45} = \frac{143}{45}$$

3	15, 9
3	5, 3
5	5, 3
	1, 1

$$\text{L.C.M.} = 3 \times 3 \times 5 = 45$$

$$(iii) 5\frac{3}{4} - 4\frac{5}{12} + 3\frac{1}{6}$$

$$= \frac{5 \times 4 + 3}{4} - \frac{4 \times 12 + 5}{12} + \frac{6 \times 3 + 1}{6}$$

$$= \frac{23}{4} - \frac{53}{12} + \frac{19}{6}$$

$$= \frac{23 \times 3 - 53 \times 1 + 19 \times 2}{12}$$

$$= \frac{69 - 53 + 38}{12} = \frac{54}{12}$$

2	4, 12, 6
2	2, 6, 3
3	1, 3, 3
	1, 1, 1

$$(iv) 6\frac{1}{6} - 5\frac{1}{5} + 4\frac{1}{4}$$

$$= \frac{6 \times 6 + 1}{6} - \frac{5 \times 5 + 1}{5} + \frac{4 \times 4 + 1}{4}$$

$$= \frac{37}{6} - \frac{26}{5} + \frac{17}{4}$$

$$= \frac{37 \times 10 - 26 \times 12 + 17 \times 15}{60}$$

$$= \frac{370 - 312 + 255}{60} = \frac{313}{60}$$

$$\text{L.C.M.} = 2 \times 3 \times 5 \times 2 = 60$$

2	6, 5, 4
	3, 5, 2

$$(v) 5\frac{2}{3} + 1\frac{3}{10} - 4\frac{2}{15}$$

$$= \frac{5 \times 3 + 2}{3} + \frac{10 \times 1 + 3}{10} - \frac{4 \times 15 + 2}{15}$$

$$= \frac{17}{3} + \frac{13}{10} - \frac{62}{15}$$

$$= \frac{17 \times 10 + 13 \times 3 - 62 \times 2}{30}$$

$$\text{L.C.M.} = 2 \times 3 \times 5 = 30$$

2	15, 10, 3
3	15, 5, 3
5	5, 5, 1
	1, 1, 1

$$= \frac{170+39-124}{30} = \frac{85}{30}$$

$$(vi) \quad 9\frac{1}{5} - 2\frac{3}{4} - 2\frac{7}{10}$$

$$= \frac{9 \times 5 + 1}{5} - \frac{4 \times 2 + 3}{4} - \frac{2 \times 10 + 7}{10}$$

$$= \frac{46}{5} - \frac{11}{4} - \frac{27}{10}$$

$$= \frac{46 \times 4 - 11 \times 5 - 27 \times 2}{20}$$

$$= \frac{184 - 55 - 54}{20} = \frac{75}{20}$$

5	5, 4, 10
2	1, 4, 2
	1, 2, 1

$$\text{L.C.M.} = 5 \times 2 \times 2 = 20$$

$$4. \quad 5\frac{2}{3} \Rightarrow \frac{5 \times 3 + 2}{3} \Rightarrow \frac{17}{3}$$

For $\frac{17}{3} = 7$, or $17 = 27$ we must add $27 - 17 = 10$ to it.

$$5. \quad 6\frac{3}{8} \Rightarrow \frac{6 \times 8 + 3}{8} \Rightarrow \frac{51}{8}$$

or $\frac{51}{8} = 10$ or $51 = 80$ as, $80 - 51 = 29$

as we must add 29 to it.

$$6. \quad \frac{5}{7} \text{ and } \frac{90}{14}$$

$$\frac{5}{7} = \frac{5 \times 2}{7 \times 2} = \frac{10}{14} \quad \text{and} \quad \frac{9}{14}$$

$$\text{L.C.M.} = 14$$

$$\frac{10}{14} > \frac{9}{14}$$

$$\text{and by } \frac{10}{14} - \frac{9}{14} = \frac{1}{14}$$

$$7. \text{ Pen cost } 6\frac{2}{3} \Rightarrow \frac{6 \times 3 + 2}{3} = \frac{20}{3}$$

Pencil cost $2\frac{1}{6} \Rightarrow \frac{2 \times 6 + 1}{6} = \frac{13}{6}$

L.C.M. = $3 \times 2 = 6$

$$= \frac{20 \times 2}{3 \times 2} = \frac{40}{6}$$

$$\frac{40}{6} - \frac{13}{6} \Rightarrow \frac{27}{6} \text{ cost more.}$$

8. $3\frac{1}{3} \Rightarrow \frac{3 \times 3 + 1}{3} = \frac{10}{3}$ hours the film show lasted for

$\frac{3}{4}$ hours spent on advertisement

L.C.M. = $4 \times 3 = 12$

Actual time $\frac{10}{3} - \frac{3}{4} = \frac{40 - 9}{12} = \frac{31}{12} = 2\frac{7}{12} \text{ hours}$

9. Ansul take $2\frac{1}{5}$ or $\frac{11}{5}$ minutes

Rinku takes $\frac{7}{4}$ minutes

L.C.M. = $5 \times 4 = 20$

$$\frac{7 \times 5}{4 \times 5} \Rightarrow \frac{35}{20}$$

$$\frac{11 \times 4}{5 \times 4} \Rightarrow \frac{44}{20}$$

so Rinku take less time by $\frac{44}{20} - \frac{35}{20} = \frac{9}{20}$

10. A piece of wire $4\frac{1}{3}$ or $\frac{4 \times 3 + 1}{3} = \frac{13}{3}$

one piece is $3\frac{1}{4}$ or $\frac{13}{4}$

remaining length of piece is $\frac{13}{3} - \frac{13}{4} = \frac{52 - 39}{12} = \frac{13}{12} \text{ or } 1\frac{1}{12}$

Check Your mental Maths IQ

1. 1 2. equal 3. improper
4. A day has 24 hours

$$\text{A fraction of 6 hour a day} = \frac{6}{24} \quad \text{or} \quad \frac{1}{4}$$

5. Natural number from 90 to 100

91, 92, 93, 94, 95, 96, 97, 98, 99

There is only one prime number *i.e.* 97

$$\text{So fraction is to be} = \frac{1}{9}$$

6. Riya get $\frac{1}{5}$ bottle juice

His brother get $\frac{1}{3}$ bottle juice

$$\text{L.C.M.} = 5 \times 3 = 15$$

$$\text{as } \frac{1 \times 3}{5 \times 3} = \frac{3}{15} \quad \text{and} \quad \frac{1 \times 5}{3 \times 5} = \frac{5}{15}$$

as his brother get more by $\frac{5}{15} - \frac{3}{15} = \frac{2}{15}$ ratio

Multiple Choice Questions

1. $\frac{36}{228}$

$$\text{So } \frac{36 \div 12}{228 \div 12} = \frac{3}{19}$$

$$\text{So (ii) } \frac{3}{19}$$

2	36	24	228
2	18	12	114
3	9	3	57
	3	19	19

$$\text{H.C.F.} = 2 \times 2 \times 3 = 12$$

2. (iii) $\frac{8 \div 4}{12 \div 4} = \frac{2}{3} = \text{and } \frac{8 \times 4}{12 \times 4} = \frac{2}{3} = \text{so (iii)}$

3. $\frac{36}{48}$

$$\text{H.C.F.} = 2 \times 2 \times 3 = 12$$

$$\text{as } \frac{36 \div 12}{48 \div 12} = \frac{3}{4}, \text{ so (i) } \frac{3}{4}$$

2	36	2	48
2	18	2	24
3	9	2	12
	3	2	6
			3

$$4. \frac{3}{4} \text{ denominator } 20$$

$$20 \div 4 = 5$$

$$\frac{3 \times 5}{4 \times 5} = \frac{15}{20} \quad (\text{i}) \quad \frac{15}{20}$$

$$5. \text{Equivalent fraction of } \frac{45}{60} \text{ with numerator } 3$$

$$45 \div 3 = 15$$

$$\frac{45 \div 15}{60 \div 15} = \frac{3}{4} \quad (\text{i})$$

$$6. (\text{iii}) \frac{8}{7}$$

$$7. \text{Total cake is divided into five part. Kruti and Agrim ate 1 each piece. i.e. } = \frac{2}{5}$$

$$\text{Left one is } \frac{5}{5} - \frac{2}{5} = \frac{3}{5} \quad (\text{ii})$$

$$8. \frac{3}{4}, \frac{5}{6}, \frac{7}{12}, \frac{2}{3}$$

$$\text{L.C.M.} = 12$$

$$\frac{3 \times 3}{4 \times 3} = \frac{9}{12}, \frac{5 \times 2}{6 \times 2} = \frac{10}{12}, \frac{7}{12}, \frac{2 \times 4}{3 \times 4} = \frac{8}{12}$$

$$\text{So, } \frac{9}{12}, \frac{10}{12}, \frac{7}{12}, \frac{8}{12}$$

$$\text{as } \frac{7}{12} \text{ is the smallest one.}$$

$$9. \quad 2\frac{1}{4} \Rightarrow \frac{9}{4}, 3\frac{1}{2} = \frac{6+1}{2} = \frac{7}{2}$$

$$\text{L.C.M.} = 4$$

$$\frac{9}{4}, \frac{7 \times 2}{2 \times 2} = \frac{14}{4}$$

$$\frac{14}{4} - \frac{9}{4} = \frac{5}{4} \quad (\text{L.C.M.} = 4)$$

$$\text{or } 1\frac{1}{4} \quad (\text{ii})$$

$$10. \quad \frac{4}{1} \text{ or } 4 \times \frac{2}{1} = 8 \quad (\text{ii})$$

$$\begin{array}{c|c} 2 & 4, 2 \\ \hline & 2, 1 \end{array}$$

Exercise 6A

1. (i) $\frac{137}{1000} \Rightarrow 0.137$

(ii) $\frac{509}{100} \Rightarrow 5.09$

(iii) $\frac{83}{1000} \Rightarrow 0.083$

(iv) $\frac{1508}{1000} \Rightarrow 1.508$

2. (i) $0.007 = \frac{7}{1000}$

(ii) $0.069 = \frac{69}{1000}$

(iii) $5.307 = \frac{5307}{1000}$

(iv) $27.834 = \frac{27834}{1000}$

3. (i) $5.680 \Rightarrow (5 \times 1) + \left(6 \times \frac{1}{10}\right) + \left(8 \times \frac{1}{100}\right)$

(ii) $218.003 \Rightarrow (2 \times 100) + (1 \times 10) + (8 \times 1) + \left(3 \times \frac{1}{1000}\right)$

(iii) $3.326 \Rightarrow (3 \times 1) + \left(3 \times \frac{1}{10}\right) + \left(2 \times \frac{1}{100}\right) + \left(\frac{6 \times 1}{1000}\right)$

(iv) $235.168 \Rightarrow (2 \times 100) + (3 \times 10) + (5 \times 1) + \left(\frac{1 \times 1}{10}\right) + \left(\frac{6 \times 1}{100}\right) + \left(8 \times \frac{1}{1000}\right)$

4. (i) 275.03 : Two hundred seventy five point zero three

(ii) 0.31 : Zero point three one

(iii) 8.006 : Eight point zero zero six

(iv) 0.568 : Zero point five six eight

5. (i) 4.5

(ii) 11.03

(iii) 0.335

(v) 0.007

(iv) 36.05

(vi) 611.123

6. (i) $300 + 80 + \frac{6}{10} + \frac{5}{1000}$ or 380.605

(ii) $500 + 20 + 7 + \frac{5}{100} + \frac{3}{1000}$ or 527.053

Exercise 6B

1. (i) 0.75, 0.07 (ii) 16.03, 16.003

(iii) 35.004, 35.400

2. (i) 6.4, 52.13, 0.064
6.400, 52.130, 0.064

(ii) 0.5, 4.826, 1.25, 3.4
0.500, 4.825, 1.250, 3.400

(iii) 2.5, 0.09, 3.58, 3.9
2.50, 0.09, 3.58, 3.90

(iv) 3.5, 0.83, 16.09, 2.548
3.500, 0.830, 16.090, 2.548

3. $73.12 > 65.24$

$6.507 < 6.57$

$7.24 < 7.32$

$11.05 > 11.005$

$2.74 > 2.704$

$0.86 < 1.06$

4. (i) 4.05, 4.58, 4.7, 6.03, 6.1

(ii) 0.05, 0.5, 5.05, 5.5, 55.5

(iii) 5.04, 5.3, 5.4, 5.43

(iv) 0.44, 4.004, 4.044, 4.4, 4.404

5. (i) 62.02, 7.62, 7.062, 6.22, 6.2

(ii) 40.4, 40.04, 4.4, 4.04, 4.004

(iii) 8.3, 3.83, 3.8, 3.38, 3.03, 3.008

(iv) 77.7, 77.07, 7.77, 7.077, 7.007

Exercise 6C

$$1. \quad (i) \quad 0.8 = \frac{8}{10}$$

$$(ii) \quad 0.09 = \frac{9}{100}$$

$$(iii) \quad 0.15 = \frac{15}{100}$$

$$(iv) \quad 0.54 = \frac{54}{100}$$

$$(v) \quad 0.125 = \frac{125}{1000}$$

$$2. \quad (i) \quad 5.5 = \frac{55}{10} = \frac{11}{2} = 5\frac{1}{2}$$

$$(ii) \quad 10.4 = \frac{104}{10} = \frac{52}{5} = 10\frac{2}{5}$$

$$(iii) \quad 9.36 = \frac{936}{100} = \frac{468}{50} = \frac{234}{25} = 9\frac{10}{25}$$

$$(iv) \quad 6.004 = \frac{6004}{1000} = \frac{3002}{500} = \frac{1501}{250} \text{ or } 6\frac{1}{250}$$

$$(v) \quad 2.108 = \frac{2108}{1000} = \frac{527}{250} = 2\frac{27}{250}$$

$$3. \quad (i) \quad \frac{33}{10} = 3.3$$

$$(ii) \quad \frac{147}{100} = 1.47$$

$$(iii) \quad \frac{6523}{1000} = 6.523$$

$$(iv) \quad \frac{25}{4} = 6.25$$

$$(v) \quad 3\frac{2}{5} \Rightarrow \frac{17}{5} = 3.40$$

$$\begin{array}{r} 5 \overline{) 17} 3.4 \\ \underline{15} \\ 20 \\ \underline{20} \\ \times \end{array}$$

(vi) $12\frac{3}{8} = \frac{96+3}{8} = \frac{99}{8}$

$$\begin{array}{r} 8 \overline{) 99} 12.375 \\ \underline{8} \\ 19 \\ \underline{16} \\ 30 \\ \underline{24} \\ 60 \\ \underline{56} \\ 40 \\ \underline{40} \\ \times \end{array}$$

12.375

(vii) $\frac{19}{20}$

$$\begin{array}{r} 20 \overline{) 190} 0.95 \\ \underline{180} \\ 100 \\ \underline{100} \\ \times \end{array}$$

0.95 Ans.

(viii) $\frac{6}{25}$

$$\begin{array}{r} 25 \overline{) 60} 0.24 \\ \underline{50} \\ 100 \\ \underline{100} \\ \times \end{array}$$

0.24

$$(ix) \ 15\frac{17}{40} \Rightarrow \frac{617}{40}$$

$$\begin{array}{r} 40 \overline{) 617} \quad 15.425 \\ \underline{40} \\ 217 \\ \underline{200} \\ 170 \\ \underline{160} \\ 100 \\ \underline{80} \\ 200 \\ \underline{200} \\ \times \end{array}$$

15.425

$$(x) \ 4\frac{7}{8} \Rightarrow \frac{32+7}{8} = \frac{39}{8}$$

$$\begin{array}{r} 8 \overline{) 39} \quad 4.875 \\ \underline{32} \\ 70 \\ \underline{64} \\ 60 \\ \underline{56} \\ 40 \\ \underline{40} \\ \times \end{array}$$

4.875

4. (i) 1 rupee = 100 paise

So, (i) 18 paise or $\frac{18}{100}$ rupees
= ₹ 0.18

(ii) 6 paise

$$\frac{6}{100} = ₹ 0.06$$

(iii) 250 paise

$$\frac{250}{100} = ₹ 0.250$$

(iv) 5 rupees 50 paise

$$5 + \frac{50}{100}$$

$$5 + 0.5 = ₹ 5.5$$

5. 1 m = 100 cm

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

$$(i) \quad 15 \text{ cm} = \frac{15}{100} \text{ m} \Rightarrow 0.15 \text{ m}$$

$$(ii) \quad 9 \text{ cm} = \frac{9}{100} \text{ m} \Rightarrow 0.09 \text{ m}$$

$$(iii) \quad 125 \text{ cm} = \frac{125}{100} \text{ m} \Rightarrow 1.25 \text{ m}$$

$$(iv) \quad 4 \text{ m } 75 \text{ cm} = 4 + \frac{75}{100} \text{ m} \Rightarrow 4.75 \text{ m}$$

6. 1 mm = 10 cm = 1 cm = $\frac{1}{10}$ mm

$$(i) \quad 5 \text{ mm} = 0.5 \text{ cm}$$

$$(ii) \quad 40 \text{ mm} = \frac{40}{10} = 4 \text{ cm}$$

$$(iii) \quad 175 \text{ mm} = \frac{175}{10} = 17.5 \text{ cm}$$

$$(iv) \quad 4 \text{ cm } 5 \text{ mm} = 4 + \frac{5}{10} = 4.5 \text{ cm}$$

7. $1 \text{ kg} = 1000 \text{ g}$

$$1 \text{ g} = \frac{1}{1000} \text{ kg}$$

(i) $15 \text{ kg } 850 \text{ g} = 15 + \frac{850}{1000} \Rightarrow 15.85 \text{ kg}$

(ii) $8 \text{ kg } 96 \text{ g} = 8 + \frac{96}{1000} \Rightarrow 8.096 \text{ kg}$

(iii) $540 \text{ g} = \frac{540}{1000} \Rightarrow 0.54 \text{ kg}$

(iv) $8 \text{ g} = \frac{8}{1000} \Rightarrow 0.008 \text{ kg}$

8. (i) ₹ 6.25

$$\text{₹ } 1 = 100 \text{ paise}$$

$$\text{so, } 6.25 \times 100 = 625 \text{ paise}$$

(ii) 3.5 cm

$$1 \text{ cm} = 10 \text{ mm}$$

$$3.5 \times 10 = 35 \text{ mm}$$

(iii) 4.05 km

$$1 \text{ km} = 1000 \text{ m}$$

$$4.05 \times 1000 = 4050 \text{ m}$$

(iv) 6.45 m

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

$$6.45 \times 100 = 645 \text{ cm}$$

(v) 8.345 kg

$$1 \text{ kg} = 1000 \text{ g}$$

$$8.345 \times 1000 = 8345 \text{ g}$$

(vi) 13.005 kg

$$1 \text{ kg} = 1000 \text{ gm}$$

$$13.005 \times 1000 = 13005 \text{ gm}$$

(vii) 12.05 m

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

$$12.05 \times 100 = 1205 \text{ cm}$$

$$(viii) 0.3 \text{ cm}$$

$$1 \text{ cm} = 10 \text{ mm}$$

$$0.3 \times 10 = 3 \text{ mm}$$

Exercise 6D

1. (i)
$$\begin{array}{r} 23.7 \\ 106.94 \\ + 68.9 \\ \hline 199.54 \end{array}$$
 (ii)
$$\begin{array}{r} 165.35 \\ 72.00 \\ + 14.85 \\ \hline 252.20 \end{array}$$
 (iii)
$$\begin{array}{r} 8.236 \\ 16.06 \\ + 63.8 \\ \hline 88.096 \end{array}$$
2. (i)
$$\begin{array}{r} 40.7 \\ 38.15 \\ + 4.02 \\ \hline 52.4 \\ \hline 135.27 \end{array}$$
 (ii)
$$\begin{array}{r} 3.702 \\ 3.2 \\ + 5.03 \\ \hline 2.37 \\ \hline 14.302 \end{array}$$
 (iii)
$$\begin{array}{r} 14.5 \\ 0.038 \\ + 110.462 \\ \hline 5.74 \\ \hline 136.74 \end{array}$$
3. (i)
$$\begin{array}{r} 53.74 \\ - 27.86 \\ \hline 25.88 \end{array}$$
 (ii)
$$\begin{array}{r} 103.8 \\ - 64.98 \\ \hline 38.82 \end{array}$$
 (iii)
$$\begin{array}{r} 39.875 \\ - 17.68 \\ \hline 22.195 \end{array}$$
4. (i)
$$\begin{array}{r} 8.645 \\ - 5.17 \\ \hline 3.475 \end{array}$$
 (ii)
$$\begin{array}{r} 18.6 \\ - 7.69 \\ \hline 10.81 \end{array}$$
 (iii)
$$\begin{array}{r} 100.000 \\ - 25.86 \\ \hline 74.14 \end{array}$$

5. Ajay spent

	₹ 85.75	for maths
	+ ₹ 62.80	for grammer
Total amount	₹ 148.55	

6.	4 kg . 250 g	rice
	+ 5 kg . 050 g	sugar
	20 kg . 750 g	atta
	30 kg . 050 g	Total Weight

7. A man covers a journey by car in 3 hours.

Distance

54 km . 435m	in 1 hour
+ 48 km . 56m	in 2 hour
42 km . 8m	in 3 hour
144 km . 499m	Total Distance

So, total distance covered by man is 144 kg 499 m

Check Your Mental Maths IQ

1. $500 + 40 + 8 + \frac{2}{10} + \frac{3}{100} = 548.23$

2. Unlike Decimals.

3. ₹ 9 and 75 Paise = 975 paise

$$\frac{975}{1000} = 9.75 \quad \text{as ₹ 9 and 75 paise}$$

4. 5 cm 8 mm

$$1 \text{ cm} = 10 \text{ mm}$$

$$5 \text{ cm} + 8 \div 10 = 5 \text{ cm} + 0.8 = 5.80 \text{ cm}$$

5. 2345 mg to g

$$\text{As } 1 \text{ g} = 1000 \text{ mg}$$

$$2345 \text{ mg} = \frac{2345}{1000} = 2.345 \text{ g}$$

6. 4 kg 5 g

$$4 + \frac{5}{1000} = 4.005 \text{ kg} \quad \left(\text{As } 1 \text{ g} = \frac{1}{1000} \text{ kg} \right)$$

7. (i), (ii) (iv)

Multiple Choice Questions

1. $\frac{3}{100} = 0.003$ (iv)

2. $\frac{123}{1000} = 0.123$ (iii)

3. (ii) 34.016

4. $125\frac{3}{1000} \Rightarrow \frac{125000+3}{1000} \Rightarrow \frac{125003}{1000} \Rightarrow 125.003$ (iii)

5. $\frac{1}{100} = 0.01$ (ii)

6. $2\text{ km } 35\text{ m} = 2.035\text{ km}$ (iii)

7. (iii) 1000 mg

8. (iii)

9. (iii)

10. $\frac{4}{10} = \frac{4 \div 2}{10 \div 2} = \frac{2}{5}$

11. $0.5 + 0.005 + 5.5 = 5.555$ (i)

12. $2.1 - 0.3 = 1.8$ (i)

13. (i) 5.004

Introduction to Algebra

1. (i) $x + 5$ (ii) $(x+3) + y$
 (iii) $(y + 8) + x$ (iv) $x - 7$
 (v) $xy + (x + y)$ (vi) $\frac{1}{4}p(x + 6)$
 (vii) $\frac{x}{y} - 2$ (viii) $\frac{1}{3}y - 4x$
 (ix) $x - 2xy$ (x) $y^2 + 3x$
2. (i) $d = 2r$; $d = \text{diameter}; r = \text{radius}$
 (ii) $p = 2(l + b)$ $p = \text{perimeter}; l = \text{length}; b = \text{breadth}$
 (iii) $a = l \times b$; $A = \text{Area of the rectangle}; l = \text{length}; b = \text{breadth}$
 (iv) $d = s \times t$; $d = \text{distance}; s = \text{speed}; t = \text{time}$
 (v) $S.P. = C.P. + P$;
 $S.P. = \text{Selling price}; C.P. = \text{Cost price}; P = \text{Profit}$
 (vi) $A = \frac{1}{2}(b \times h)$
 $b = \text{base}; h = \text{height}; A = \text{area}$
3. (i) $4(y + 1)$ (ii) $3(y - 4)$
 (iii) $4(y + 2)$ (iv) $\frac{1}{3}(y - 5) - 3$
4. 80 marks in science x marks in maths
 $(80 + x)$ marks = total
5. 2 weeks has 14 days
 $\text{Expenditure} = ₹14x$, $\text{saving } ₹14y$
 $\text{Income in 2 weeks's}$

$$\text{Income} = \text{expenditure} + \text{savings}$$

$$₹(14x + 14y)$$

6. In 1 step Rahul cover 'a' centimeter

Another in 'b' steps he will cover = $a \times b = ab$ cms

Exercise 7B

1. (i) $8x$ is 8 (ii) y in $-7y = -7$
 (iii) a in $-5ba = -5b$ (iv) p in $-qrp = -qr$
 (v) y^2 in $8xzy^2 = 8xz$ (vi) z in $-7xyz = -7xy$
 (vii) a^2 in $7a^2 = 7$
2. (i) $xy = 7$ (ii) $-5ab = -5$
 (iii) $-7xyz = -7$ (iv) $-2xy^2z = -2$
 (v) $2p^3 = 2$
3. (i) $-a \times -a \times -a = -a^3$ (ii) $p \times p$ 10 times = p^{10}
 (iii) $6 \times x \times x \times y \times y \times y = 6x^2y^3$
 (iv) $-3y \times -3y \times -3y \times -3y \times -3y = -(3y)^5$
4. (i) $2p^3 = 2 \times p \times p \times p$ (ii) $x^2y^3 = x \times x \times y \times y \times y$
 (iii) $9xy^2z = 9 \times x \times y \times y \times z$
 (iv) $-4a^3b^2 = -4 \times a \times a \times a \times b \times b$
5. (i) $5x^2 - 3y$ Binomial
 (ii) $3x^5$ Monominal
 (iii) $5x - 3y + 7z$ Trinominal
 (iv) $2x^2y^2 + 4y^2z - z^4$ Trinominal
 (v) $ax - by$ Binominal
 (vi) -18 Monomlal
 (vii) $5 + 7x^3y^3z^3$ Binomial
 (viii) $a + b - c$ Trinominal

6. $x = 1, y = 3$ and $z = 4$

(i) $3x - 4y + 5$

$$x = 1, y = 3, z = 4$$

$$3 \times 1 - 4 \times 3 + 5 = -4$$

(ii) $2x^2y - 5yz - z^2$

$$2 \times 1 \times 3 - 5 \times 3 \times 4 - (4)^2 = -70$$

(iii) $4x^3 - 3y^2 - 2z^2$

$$7 \times (1)^3 - 2 \times (3)^2 - 2 \times (4)^2 = -55$$

Check Your Mental Maths

1. $a = 4, b = 3$ and $c = 1$

(i) $a^2 + b + c$

$$= 4 \times 4 + 3 + 1 = 16 + 3 + 1 = 20$$

(ii) $3a - 2b + c$

$$= 3 \times 4 - 2 \times 3 + 1 = 12 - 6 + 1 = 7$$

(iii) Constant term of

(b) $5x + 9 = 9$

(a) $a^2 + b^2 - 7 = -7$

3. (i) $-8xy^2z$

$$-8y^2z$$

(ii) $6x + 5a$

$$6$$

(iii) $xy + z$

$$y$$

4. y in $5x^2yz = 5x^2z$

x in $(-4x) = -4$

5. $5 \times a + 3b$

6. $x = \text{total}$

$-4 = \text{absent}$

$x - 4 = \text{present}$

Multiple Choice Questions

1. (ii) literals

2. (ii) $5x$

3. (i) $5x + 3y$

4. (ii) 4 as $3 \times 0 + 2 \times 1 + 2 = 4$

5. (iii) $p = 4 \times \text{side}$ then (4S)

6. (i) $\frac{(9)^2 - 36}{3} = \frac{81 - 36}{3} = \frac{45}{3} = 15 \text{ years}$

7. (i) $45/3 = 15 \text{ years}$

8. (iii) monominal

Ratio And Proportion

1. (i) $\frac{30\text{minutes}}{55\text{minutes}} = \frac{6}{11}$ or 6:11

(ii) 1 day = 24 hours

2 days = 48 hours

$\frac{18}{48} = \frac{3}{8}$ or 3:8

(iii) $\frac{81}{108} = \frac{3}{4}$ or 3:4

(iv) $2 \times 1000 \text{ ml} + 750 \text{ ml}$ and 750 ml

$\frac{2750}{750} = \frac{11}{3}$ or 11:3

2. (i) $\frac{72}{30} = \frac{72 \div 6}{30 \div 6} = \frac{12}{5}$ or 12:5

(ii) $\frac{5.4}{1.8} = \frac{54 \div 18}{18 \div 18} = \frac{3}{1}$ or 3:1

(iii) $\frac{65 \div 5}{15 \div 5} = \frac{13}{3}$ or 13:3

(iv) $\frac{440}{990} = \frac{440 \div 110}{990 \div 110} = \frac{4}{9}$ or 4:9

3. (i) 48 paise to ₹ 3

$\frac{48}{300} = \frac{48 \div 12}{300 \div 12} = \frac{4}{25}$ or 4:25

(ii) 4m to 64 cm

$\frac{400}{64} = \frac{400 \div 16}{64 \div 16} = \frac{25}{4}$ or 25:4

(iii) 26 kg to 20 g

$$\frac{2600}{20} = \frac{26000 \div 20}{20 \div 20} = \frac{1300}{1} \text{ or } 1300:1$$

(iv) 8 weeks : 8 days

$$\frac{7 \times 8}{8} = \frac{7}{1} \text{ or } 7:1$$

4. English	88	Maths	99
Hindi	92	Science	96
Social Science	95		

$$(i) \frac{\text{English}}{\text{Math}} = \frac{88 \div 11}{99 \div 11} = \frac{8}{9} \text{ or } 8:9$$

$$(ii) \frac{\text{Total marks obtained}}{\text{Maximum marks}} = \frac{476}{500} = \frac{47}{50} \text{ or } 47:50$$

$$(iii) \frac{\text{Maths}}{\text{Science}} = \frac{99}{96} = \frac{33}{32} \text{ or } 33:32$$

$$5. (i) \frac{\text{Mr Ajeet's Income}}{\text{Income of wife}} = \frac{9200}{4950} = \frac{184}{99} \text{ or } 184:99$$

$$(ii) \frac{\text{Mrs Ajeet's Income}}{\text{Income of husband}} = \frac{4950}{9200} = \frac{4950 \div 50}{9200 \div 50} = \frac{99}{184} \text{ or } 99:184$$

$$(iii) \frac{\text{Mr Ajeet's Income}}{\text{Total Income of two}} = \frac{9200}{4950 + 9200} = \frac{9200}{14150} \\ = \frac{184}{283} \text{ or } 184:283$$

$$6. (i) \frac{\text{No. of girls}}{\text{No of boys}} = \frac{20}{30} = \frac{2}{3} \text{ or } 2:3$$

$$(ii) \frac{\text{No. of boys}}{\text{Total students}} = \frac{30}{50} = \frac{3}{5} \text{ or } 3:5$$

$$(iii) \frac{\text{No. of girls}}{\text{Total students}} = \frac{20}{50} = \frac{2}{5} \quad \text{or } 2:5$$

7. Pari's age = 15 years, Vasu's age = $15 + 3 = 18$ years,

Mother's age = 40 years

$$(i) \text{ Pari's age to Vasu's, } \frac{15}{18} = 5:6$$

(ii) Vasu's age and his mother's age

$$\frac{18}{40} = \frac{9}{20} \quad \text{or } 9:20$$

$$8. \frac{\text{Wt. of copper}}{\text{Wt. of alloy}} = \frac{60}{60 + 52} = \frac{60 \div 4}{112 \div 4} = \frac{15}{28} \quad \text{or } 15:28$$

$$9. \text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Speed of car} = \frac{120}{3}$$

$$= 40 \text{ km/hr}$$

$$\text{Speed of bus} = \frac{100}{2}$$

$$= 50 \text{ km/hr}$$

$$\text{Ratio of their speeds} = \frac{40}{50} = \frac{4}{5} \quad \text{or } 4:5$$

Exercise 8B

1. 121 divided in two parts 9 : 2

$$\begin{aligned} \text{1st part} &= \frac{\text{Ist term of ratio}}{\text{Sum of ratios}} \times \frac{\text{Total}}{1} \\ &= \frac{9}{11} \times 121 \\ &= 99 \end{aligned}$$

$$\text{IInd part} = \frac{2}{11} \times 121 = 22$$

$$2. \text{ Ist part} = \frac{10}{17} \times 3400 = ₹ 2000$$

$$\text{IInd part} = \frac{4}{17} \times 3400 = ₹ 800$$

$$\text{IIIRD part} = \frac{3}{17} \times 3400 = ₹ 600$$

$$3. \text{ Ratio of Numbers} = 1 : 8$$

$$\text{Sum of the numbers} = 135$$

$$\text{First Number} = \frac{1}{9} \times \frac{135}{1} = 15$$

$$\text{Second Number} = \frac{8}{9} \times \frac{135}{1} = 120$$

So, the numbers are 15 and 120.

$$4. \frac{\text{length}}{\text{width}} = \frac{5}{3}$$

$$\text{Width} = 42 \text{ m}$$

$$\frac{l}{42} = \frac{5}{3}$$

$$3l = 210$$

$$l = 70$$

$$5. \text{ Boys : Girls} = 15 : 19$$

$$\text{Total strength} = 204$$

$$\text{Boys} = \frac{15}{34} \times \frac{204}{1} = 90$$

$$\text{Girls} = \frac{19}{34} \times \frac{204}{1} = 114$$

$$6. \quad \frac{\text{Copper}}{\text{Zinc}} = \frac{5}{3}$$

$$\frac{30.5}{\text{Zinc}} = \frac{5}{3}$$

$$\frac{91.5}{5} = \text{Zinc}$$

$$\text{Zinc} = 18.3 \text{ grams}$$

$$7. \text{ Ist part} = \frac{11}{20} \times 8000 = ₹4400$$

$$\text{IInd part} = \frac{9}{20} \times 8000 = ₹3600$$

$$8. \quad \frac{\text{Income}}{\text{Expenditure}} = \frac{17}{12} \Rightarrow \frac{\text{Income}}{232} = \frac{17}{12}$$

$$\text{Income} = \frac{17 \times 232}{12} = ₹ \frac{986}{3} = ₹328.67$$

Exercise 8C

$$1. \text{ (i) } 55:33 :: 60:48$$

$$55 \times 48 = 33 \times 60$$

$$2640 \neq 1980$$

False

$$\text{(ii) } 36:45 :: 80:100$$

$$36 \times 100 = 45 \times 80$$

$$3600 = 3600$$

True

$$\text{(iii) } 6:21 :: 10:35$$

$$6 \times 35 = 21 \times 10$$

$$210 = 210$$

True

$$\text{(iv) } 32 \text{ kg} : ₹36 :: 8 \text{ kg} : ₹9$$

$$32 \times 9 = 36 \times 8$$

$$288 = 288$$

True

$$2. \text{ (i) } \frac{51}{85} = \frac{57}{x}$$

$$51x = 57 \times 85$$

$$x = \frac{57 \times 85}{51} = 95$$

$$x = 95$$

$$(ii) \frac{x}{92} = \frac{87}{116}$$

$$x = \frac{87 \times 92}{116}$$

$$x = 69$$

$$3. (i) 32, 48, 72, 210$$

$$32 \times 210 = 48 \times 72$$

$$6720 \neq 3456$$

No.

$$(ii) 150, 200, 250, 300$$

$$150 \times 300 = 200 \times 250$$

$$45000 \neq 50000$$

No

$$4. \text{ Let Third term be } x.$$

$$32, 112, x, 217$$

$$32 : 112 :: x : 217$$

$$\frac{32}{112} = \frac{x}{217} = \frac{434}{7} = x \Rightarrow 62 = x$$

So, the third term is 62.

$$5. \text{ Let the 2nd term be } x$$

$$7, x, 28, 68$$

$$\frac{7}{x} = \frac{28}{68} \Rightarrow \frac{7 \times 68}{28} = x$$

$$17 = x$$

So, the second term is 17.

$$\begin{aligned}
 6. \quad \frac{80}{64} &= \frac{x}{24} \\
 \frac{5 \times 24}{4} &= x \\
 x &= 30
 \end{aligned}$$

$$7. \quad 48, 36, x$$

$$\begin{aligned}
 \frac{48}{36} &= \frac{36}{x} \\
 x &= \frac{36 \times 36}{48}
 \end{aligned}$$

$$x = 27$$

$$8. \quad \text{Length of rectangular field or its perimeter} = 63 \text{ m}$$

$$\text{Length : breadth} = 5 : 4$$

$$\text{Let the length be} = 5x$$

$$\text{breadth} = 4x$$

$$\begin{aligned}
 \text{Perimeter} &= 2(\ell + b) \\
 &= 2(5x + 4x) \\
 &= 18x
 \end{aligned}$$

$$18x : 63$$

$$x = \frac{63}{18} = 3.5 \text{ m}$$

$$\begin{aligned}
 \text{So breadth} &= 4x \\
 &= 4 \times 3.5 = 14 \text{ m}
 \end{aligned}$$

Exercise 8D

$$1. \quad \text{Cost of 8 m cloth is ₹ 320}$$

$$\text{Costs of 1 m cloth is} = \frac{320}{8} = ₹ 40$$

$$\text{Cost of 12 m cloth is} = 40 \times 12 = ₹ 480$$

$$2. \quad 1000 \text{ apples in 25 box}$$

$$\text{In 1 box} = 40 \text{ apples}$$

$$\text{In 92 box} = 40 \times 92 = 3680 \text{ apples}$$

3. 180 person rice for 3 days.

1 person rice for = 180×3 days

$$10 \text{ person rice for} = \frac{3}{10} \times 180$$

So, 10 persons = 54 days

4. The weight of 52 books = 13 kg

$$\text{The weight of 1 book} = \frac{52}{13}$$

$$\text{The weight of 63 books} = \frac{52}{13} \times 63 = 252 \text{ kg}$$

5. Aashi made 42 run in 6 over

$$\text{per over } 7 \text{ runs} \left(\frac{42}{6} \right)$$

Sparsh made 81 runs in 9 overs

$$\text{per over } \frac{81}{9} = 9 \text{ runs}$$

So, sparsh made more runs per over.

6. 3 pens, 5 pencils = ₹14

$$3 \times 4 = 12 \text{ pen and } 5 \times 4 = 20 \text{ pencils} = 14 \times 4 = ₹ 56$$

7. Earn ₹ 15 per hour

$$\text{in 8 hour or 1 day} = 15 \times 8$$

$$\text{For 5 days} = 15 \times 8 \times 5 = ₹ 600$$

8. Cost of 6 kg rice – Cost of 8 kg wheat

$$\text{Cost of 1 kg wheat} = 6$$

$$\text{Cost of 8 kg wheat} = ₹ 48$$

$$\text{Cost of 1 kg rice} = \frac{48}{6} = 8$$

Check Your Mental Maths

1. Extreme term

2. Middle term

$$3. 50 \text{ g to } 2 \text{ kg} \Rightarrow 50 \text{ g to } 2000 \text{ g}$$

$$= \frac{50}{2000} \Rightarrow 1:40$$

$$4. \frac{\text{Defective bulbs}}{\text{good bulbs}} = \frac{20}{(100-20)} \Rightarrow \frac{20}{80} = \frac{1}{4} \quad \text{or } 1:4$$

$$5. \frac{5}{9} < \frac{10}{14} \quad \text{So } 10:14 \text{ is greater.}$$

$$6. \frac{\text{Income}}{\text{Expenditure}} = \frac{8}{5} \Rightarrow \frac{\text{Income}}{\text{Saving}} = \frac{8}{8-5} = \frac{8}{3}$$

$$\frac{\text{Income}}{3000} = \frac{8}{3} \Rightarrow \text{Income} = \frac{8}{3} \times 3000 = ₹8000$$

Multiple Choice Questions

1. (ii)

$$1:3:5$$

Let ratio be $1x, 3x$ and $5x$

$$\text{Perimeter} = 1x + 3x + 5x = 180$$

$$9x = 180$$

$$x = 20$$

$$\text{Largest side} = 5 \times 20 = 100 \text{ cm}$$

2. (ii) 1 dozen = 12, 1 score = 20 so $12:20 = 3:5$

3. (i) 550 men provision = 28 days

$$1 \text{ man provision} = 28 \times 550$$

$$700 \text{ men} = \frac{28 \times 550}{700} = 22 \text{ days}$$

$$4. (ii) \frac{9}{x} = \frac{x}{49}$$

$$9 \times 49 = x^2$$

$$3 \times 7 = x$$

$$x = 21 \text{ (iii)}$$

$$5. (i) \frac{45}{x} = \frac{25}{35}$$

$$\frac{45 \times 7}{5} = x$$

$$63 = x (i)$$

$$6. (ii) \frac{a}{b} = \frac{c}{d}$$

$$ad = cb (ii)$$

$$7. (ii) a, b, c$$

$$\frac{a}{b} = \frac{b}{c}$$

$$ac = b^2 (ii)$$

$$8. (ii) 40, 30, 100, 75$$

$$\therefore 40 \times 75 = 30 \times 100$$

$$3000 = 3000$$

$$9. (i) \text{ Cost of 1 packet of 1 pencil} = \frac{750}{25 \times 12}$$

$$\text{Cost of 30 packets of 8 pencils} = \frac{750}{25 \times 12} \times \frac{30 \times 8}{1}$$

$$= ₹ 600$$

$$10. (i) \text{ Weight of alloy} = 10.4 \text{ g}$$

$$\text{Given, ratio of zinc : copper} = 5 : 3$$

$$\text{Total Ratio} = 8$$

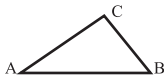
$$\text{Weight of Zinc} = \frac{5}{8} \times 10.4 \text{ g} = 6.5 \text{ g}$$

8

GEOMETRY

Basic Geometrical Concepts

Exercise 8A

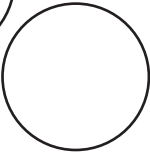
- Infinite
 - Infinite
 - one
 - three, one
- mark of a pointed pencil and a tiny prick made by a fine pin.
 - a straight thread, edge of a table.
 - floor of a room, top of a table
 - surface of a ball, surface of a bowl
 - a wall, a black board.
- 

AB, BC, CA = Three lines
- Four line segments = PQ, QS, SR, RP
 - Four rays = PB, QD, SC, RA
 - two non-intersecting line segments = AB, CD
- p, q; q, r; p, r
 - LM, BC; MN; CD
 - L; M, N; A, B, C, D
 - x and p
 - x and y
 - y and q
- 8
 - 12
 - 8

Exercise 9B

- 

Open curve



Closed curve
- open
 - closed
 - closed

- (iv) open (v) closed (vi) closed
 (vii) closed
3. (i) No (ii) Yes (iii) No
 (iv) No
4. (i) Inside, P, R; on A, B, C, D, E, F; outside S, Q.
 (ii) Inside - no - point; on P, Q, R, X, Y, Z;
 Outside A, B, C
5. (i) linear boundary (ii) curvilinear boundary
 (iii) linear boundary (iv) linear boundary
 (v) curvilinear boundary

Exercise 9C

1. (i) hand of a clock;
 arm of a divider;
 a scissor
2. Vertex = Q; Arms PQ, QR
3. (i) $\angle L, \angle M, \angle N$ (ii) $\angle P, \angle Q, \angle R, S$
 (iii) $\angle A, \angle C, \angle ABD, \angle ADB, \angle CDB, \angle CBD$
4. (i) U, V (ii) S, T (iii) A, O, B, P, Q, R
5. (i) $\angle PQC$ (ii) $\angle XPB$ (iii) $\angle DQY$
6. (i) False (ii) True (iii) False
 (iv) False (v) True

Exercise 9D

1. (i) Line segment



Triangle

2. A cone, A jockey Cap, a pencil sharp edge
3. (i) PQ (ii) $\angle P$ (iii) Q (iv) QR
4. (i) P, Q, R, B, A, L, T, O (ii) M, N
5. Altitudes AL, BM and CN



7. A figure bounded by three line segments is called a triangle;
 the interior of the ABC, together with triangle is called the

triangular region ABC.

Exercise 9E

1. (i) Adjacent side = 4
PQ, QR; QR, RS; RS, SP; SP, PQ
(ii) Opposite sides = 2
PQ, SR; RS, QR
(iii) Adjacent angles = 4
 $\angle P, \angle Q; \angle Q, \angle R; \angle R, \angle S, \angle S, \angle R$
(iv) Opposite angles = 2
 $\angle P, \angle R; \angle Q, \angle S$
2. In the quadrilateral in which the measure of each angle is less than 180° is called a convex quadrilateral.
3. (i) quadrilateral : ABCD
(ii) Interior points — x, y
(iii) exterior points — s
(iv) point on it — A, B, Z, C, W, D

Exercise 9F

1. (i) centre O (ii) three radii OA, OB, OC
(iii) diameter (iv) two minor arc AC, BC
(v) two chords AC, BC
(vi) Two sectors COB, AOC
(vii) two segments AC, ABC
2. (i) Circle : A circle is a simple closed curve all of whose points are at the same distance from point O in the same plane.
(ii) radius : It is the distance from the centre to any point on the circle.
(iii) Diameter : It is said to be the longest chord and two of the radius is called diameter.
(iv) Centre : It is the point where distance is fixed throughout.
(v) Chord : It is the joining of the two point of the circle.
5. (i) $d = 2r$
$$\frac{12}{2} = r$$

$$r = 6$$

6. length of the longest chord is diameter

$$= 2r$$

$$= 2 \times 3.5 = 7 \text{ cm}$$

7. (i) $>$ (ii) $<$ (iii) $>$ (iv) $>$

Check Your Mental Maths

- | | | |
|--|---------------------|---------------|
| 1. None | 2. Infinite | 3. Three |
| 4. 180° | 5. Diameter | 6. Median |
| 7. (i) True | (ii) True | (iii) False |
| (iv) True | (v) False | (vi) False |
| (vii) True | (viii) True | (ix) True |
| (x) True | (xi) False | (xii) False |
| (xiii) True | (xiv) False | (xv) True |
| (xvi) False | (xvii) False | (xviii) False |
| (xix) False | (xx) False | (xxi) True |
| (xxii) False | | |
| 8. (i) No | (ii) one | (iii) certain |
| (iv) certain | (v) flat curved | |
| (vi) one common point or no common point | | |
| (vii) four, four | (viii) four, two | (ix) opposite |
| (x) three | (xi) Two | (xii) centre |
| (xiii) longest | (xiv) equal | |
| (xv) centre, circumference | | (xvi) common |
| (xvii) sector | (xviii) equidistant | |

Multiple Choice Questions

- | | |
|--------------------------------|------------------------|
| 1. (i) one point | 2. (ii) same line |
| 3. (ii) a median | 4. (i) definite length |
| 5. (i) one vertex and two arms | 6. (ii) circumference |
| 7. (i) secant | 8. (ii) diameter |
| 9. (iii) 5.2 cm | 10. (iv) four |

Exercise 10A

1. (i) $AB = CD$ (ii) $AB < BD$
 (iii) $AC = BD$ (iv) $AD < AC$
4. AB length is $7.5\text{cm} - 2\text{cm} = 5.5\text{cm}$

Exercise 10B

1. (i) 180° straight (ii) 92° obtuse
 (iii) 200° reflex (iv) 360° complete
 (v) 188° reflex (vi) 149° obtuse
 (vii) 2 right angle $= 180^\circ$ straight (viii) 64° acute
 (ix) $4 \times \text{right angle} = 4 \times 90^\circ = 360^\circ$ Complete
2. (i) acute (ii) obtuse
 (iii) acute (iv) straight
 (v) right (vi) complete
 (vii) acute
3. (i) 90° (ii) 180° as $90^\circ \times 2 = 180^\circ$
 (iii) 270° as $3 \times 90 = 270^\circ$
 (iv) $1\frac{1}{2}$ right angle

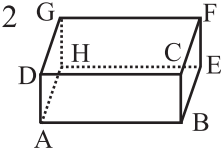
$$\frac{3}{2} \times 90 = 135$$

 (v) $\frac{2}{3}$ right angle $\frac{2}{3} \times 90 = 60$
 (vi) 4 right angle

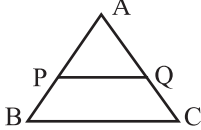
$$4 \times 90^\circ = 360^\circ$$
4. (i) $90^\circ + 90^\circ + 90^\circ = 270^\circ$ (ii) 90°
 (iii) 360° (iv) 180°
7. (i) a straight angle = north east
 (ii) A complete angle = South west

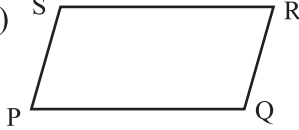
Exercise 10C

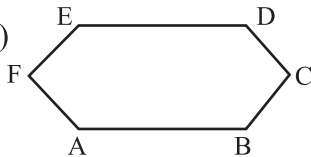
1. No, because they meet on producing

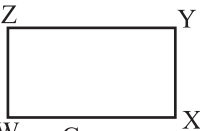


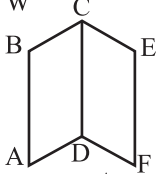
AB, HE; BE, AH; DC, GF; AD, GH; CB, EF; AB, CD, EH, GF

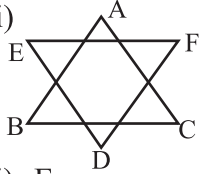
3. (i)  $PQ \parallel BC$

(ii)  (ii) $SR \parallel PQ$
 $SP \parallel RQ$

(iii)  $ED \parallel AB, EF \parallel BC, FA \parallel DC$

(iv)  $ZY \parallel WX, ZW \parallel YX$

(v)  $CD \parallel AB; CD \parallel EF; BC \parallel AD; CE \parallel DF$
 $AB \parallel EF$

(vi)  $AB \parallel FD; AC \parallel ED; BC \parallel EF$

5. (i) E (i) three
 (ii) N (ii) one
 (iii) M (iii) one
 (iv) F (iv) one

6. (a) L

(b) H, I

Exercise 10D

1. (i) Triangle : It is a set of 3 non-collinear point joint each other.
(ii) Scalene triangle : No side is equal in length.
(iii) Isoscles triangle : Any two sides are equal in length.
(iv) Equilateral triangle : All the three sides are equal in length.
(v) Acute triangle : A triangle whose angle are (measured less than 90°) are acute triangle.
(vi) Right triangle : A triangle whose angle is 90° is called right angle triangle.
(vii) Obtuse triangle : A triangle whose one of its angle is obtuse are called obtuse triangle.
2. (i) isosceles (ii) isosceles
(iii) scalene (iv) equilateral
(v) isosceles
3. (i) right angled (ii) acute angled
(iii) right angled (iv) obtuse angled
(v) acute angled

4. Sum of the three angles of triangle = 180°

$$\text{So, } 60 + 65 + \angle 3^{\text{rd}} = 180^\circ$$

$$\angle 3^{\text{rd}} = 180 - 125 = 55^\circ$$

So, third angle is 55° .

5. Let the ratio be x.

So angles are $2x, 3x, 4x$

$$2x + 3x + 4x = 180^\circ \text{ (sum of angle of triangle)}$$

$$9x = 180^\circ$$

$$x = 20^\circ$$

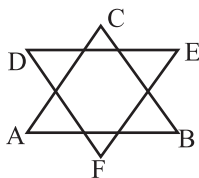
So, angles are :

$$2 \times 20 = 40^\circ$$

$$3 \times 20 = 60^\circ$$

$$4 \times 20 = 80^\circ$$

6.



In ABC

$$\text{as } \angle A + \angle B + \angle C = 180^\circ$$

(sum of angle of triangle of 180°) ..(i)

In DEF

$$\angle D + \angle E + \angle F = 180^\circ \text{ (same as above) (ii)}$$

Adding eq (i) and eq (ii)

$$\angle A + \angle B + \angle C + \angle D + \angle E + \angle F = 180^\circ + 180^\circ = 360^\circ$$

7. In a right angle one anle is 90° and another is 40° .

$$\text{So, } 90 + 40 + 3\text{rd} = 180^\circ$$

$$3\text{rd} = 180^\circ - 130^\circ$$

$$3\text{rd} = 50^\circ$$

So, the other acute angle = 50°

8. $\angle I^\circ = 100^\circ$

Let the equal angles be x

$$\text{The } 100 + 2x = 180^\circ$$

$$2x = 80^\circ$$

$$x = 40^\circ \text{ each}$$

Exercise 10E

1. (i)



Parallelogram

(ii) square ☐

(iv) trapezium 

2. (i) rhombus

3. (i) Triangle

(iii) 6

(v) Heptagon

4. Let ratio be x so $3x, 4x$

(iii) rectangle ☐

(v) kite 

(ii) square

(ii) Quadritateral

(iv) 5

(vi) Octagon

$$2(1+b)=56$$

$$2(7x)=56 \Rightarrow x=4$$

So, sides be $3 \times 4 = 12$ cm
 $4 \times 4 = 16$ cm

Check Your Mental Math

- | | |
|-----------------------------|----------------------------|
| 1. Linear angle | 2. 180° |
| 3. 360° | 4. No |
| 5. No | |
| 6. (i) True | (ii) False |
| (iv) False | (v) True |
| (vii) False | (viii) False |
| (x) False | (xi) True |
| (xiii) True | (xiv) False |
| 7. (i) Scalane | (ii) Unequal |
| (iii) isosceles | (iv) 180° |
| (v) 180° | (vi) obtuse angle triangle |
| (vii) trapezium | (viii) parallelogram |
| (ix) equal, unparallel side | (x) kite |
| (xi) square | |

Multiple Choice Questions

- | | |
|-----------------------------|-------------------|
| 1. (iv) six sides | 2. (i) 90° |
| 3. (ii) an obtuse angle | 4. (i) 60 seconds |
| 5. (ii) 180° | 6. (i) 3 |
| 7. (iii) a scalene triangle | 8. (i) trapezium |
| 9. (i) complete angle | 10. (ii) East |

11

Three Dimensional Shapes

Exercise 11

1. (i) cuboid (ii) sphere
(iii) cuboid (iv) cone
(v) cone (vi) cube
2. (i) ice cream cone, a conical tent
(ii) a chalk box, an ice cube
(iii) a water pipe, a test tube
(iv) a matchbox, a book

4.	Solid	No. of face	No. of vertices	No. of edges
	(i) cube	6	8	12
	(ii) cylinder	2	0	2
	(iii) sphere	1	0	0
	(iv) cone	2	1	1
	(v) triangular prism	5	6	9
4.	(iv) cone			

Check Your Mental Maths IQ

1. (i) cubical (ii) cuboidal
(iii) cylindrical (iv) conical
2. sphere
3. (a) True (b) True
(c) four (d) rectangular

Multiple Choice Questions

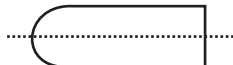
1. (iv) none of these
2. (iv) length breadth and height
3. (ii) cylinder
4. (ii) cylinder
5. (iii) 9
6. (iii) circle
7. (ii) cube
8. (iii) sphere
9. (ii) cylinder

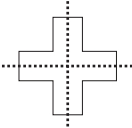
12

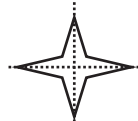
Symmetry (Reflection)

Exercise 12A

1. (i) S (ii) S (iii) NS (iv) NS

2. (i) one 

- (ii) two 

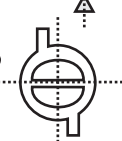
- (iii) two 

- (iv) no 

- (v) no 

- (vi) one 

- (vii) one 

- (viii) no 

4. (i) Symmetrical
(iii) Symmetrical
(v) Non-symmetrical

- (ii) Non-symmetrical
(iv) Non-symmetrical
(vi) Symmetrical

Check Your Mental Maths

- | | | |
|-----------|-------------|--------|
| 1. 3 | 2. 2 | 3. 2 |
| 4. 4 | 5. infinite | 6. I |
| 7. Circle | 8. Four | 9. one |
| 10. No | | |

Multiple Choice Questions

- | | |
|----------------------------|-------------------------------------|
| 1. (i) 4 | 2. (iv) × |
| 3. (ii) isosceles | 4. (iii) countless line of symmetry |
| 5. (i) no line of symmetry | |
| 6. (i) one | |

14

MENSURATION

Perimeter And Area

Exercise 14A

1. Perimeter of rectangle = $2(l + b)$

(i) 7cm, 5cm

$$2(l + b)$$

$$= (7 + 5) = 2 \times 12 = 24 \text{ cm}$$

(ii) 4 cm, 3 cm

$$2(l + b)$$

$$2(4 + 3) = 2 \times 7 = 14 \text{ cm}$$

(iii) 6.5cm, 3.5 cm

$$2(l + b)$$

$$2(6.5 + 3.5) = 2 \times 10 = 20 \text{ cm}$$

2. Perimeter of square = $4 \times \text{sides}$

(i) 9 cm

$$4 \times 9 = 36 \text{ cm}$$

(ii) 4 cm

$$4 \times 4 = 16 \text{ cm}$$

(iii) 56.5

$$4 \times 56.5 = 226 \text{ cm}$$

3. Perimeter 180 cm, length

$$2(58 + b) = 180 \text{ cm}$$

$$116 + 2b = 180 \text{ cm} \Rightarrow 2b = 180 - 116 = 64$$

$$b = \frac{64}{2} = 32 \text{ cm}$$

(ii) 70 cm

$$2(70 + b) = 180 \text{ cm}$$

$$140 + 2b = 180 \text{ cm} \Rightarrow 2b = 180 - 140 = 40$$

$$b = \frac{40}{2} = 20 \text{ cm}$$

(iii) 51 cm

$$2(51 + b) = 180 \text{ cm}$$

$$102 + 2b = 180$$

$$2b = 180 - 102 = 78 \Rightarrow b = \frac{78}{2} = 39 \text{ cm}$$

4. Perimeter of square = 4 sides

(i) 16 cm

$$16 = 4s$$

$$\frac{16}{4} = s$$

$$\text{side} = 4 \text{ m}$$

(ii) 30 cm

$$30 = 4S$$

$$\frac{30}{4} = 7.5$$

$$= 7.5 \text{ cm}$$

(iii) 22 cm

$$22 = 4S$$

$$S = \frac{22}{4} = 5.5 \text{ cm}$$

5. Let the length and breadth be $= 3x$ and $2x$ respectively.

$$\text{So, Perimeter } 2(3x + 2x) = 10x = 30 \text{ cm} \Rightarrow x = \frac{30}{10} = 3 \text{ cm}$$

$$\text{So, length} = 3x = 3 \times 3 = 9 \text{ cm}$$

$$\text{Breadth} = 2x = 2 \times 3 = 6 \text{ cm}$$

6. Cost at ₹ 25 per meter is ₹ 1600

$$\text{So, Perimeter} = 1600 \div 25 = 64 \text{ m}$$

$$\text{Perimeter of square} = 64 \text{ m}$$

$$\text{So, } 4 \times \text{sides} = 64 \text{ m}$$

$$\text{Side} = \frac{64}{4} = 16$$

So, side = 16m

$$\begin{aligned} 7. \text{ Perimeter} &= 2(l+b) \\ &= 2(140 + 100) \\ &= 2(240) = 480\text{m} \end{aligned}$$

$$4 \text{ round} = 4 \times 480 = 1920 \text{ m}$$

and the cost of fencing is

$$\begin{aligned} &= 24 \times 1920 \\ &= ₹ 46080 \end{aligned}$$

$$\begin{aligned} 8. \text{ Perimeter of a square field} &= 4 \times S \\ &= 4 \times 200 = 800\text{m} \end{aligned}$$

$$\begin{aligned} \text{Perimeter of rectangular field} &= 2(l+b) \\ &= 2(300 + 110) \\ &= 2(410) = 820\text{m} \end{aligned}$$

$$\text{Total distance covered by Kruti} = 800 \times 3 = 2400\text{m}$$

$$\text{Total distance covered by Riya} = 820 \times 3 = 2460\text{m}$$

$$\begin{aligned} \text{The greater distance is to be covered by Riya by } &2460 - 2400 \\ &= 60\text{m} \end{aligned}$$

$$9. \text{ Let the breadth be } = x\text{m}$$

$$\text{So, Length be } = 2x\text{m}$$

$$\begin{aligned} \text{Perimeter} &= 2(l+b) \\ &= 2(2x + x) = 2 \times 3x = 6x \end{aligned}$$

$$\begin{aligned} 5 \text{ round mean} &= 5 \times \text{Perimeter} \\ &= 5 \times 6x = 30x \end{aligned}$$

$$\text{Given, } 30x = 3 \text{ km or } 3000 \text{ m}$$

$$\text{So, } x = \frac{3000}{30} = 100\text{m}$$

$$\text{So, Length of field} = 2 \times 100 = 200\text{m}$$

$$10. \text{ (i) } 3 \times \text{sides}$$

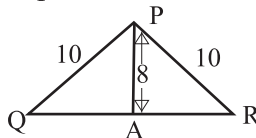
$$3 \times 9 = 27 \text{ cm}$$

$$\text{(ii) } 8 + 8 + 6 = 22 \text{ cm is the perimeter of isosceles triangle}$$

$$\text{(iii) } (10)^2 = (8)^2 + (AR)^2$$

$$100 = 64 + (AR)^2$$

$$36 = (AR)^2$$



$$6 = AR$$

$$\text{So, } QR = 2 \times 6 = 12 \text{ cm}$$

$$\text{So, Perimeter} = 10 + 10 + 12 = 32 \text{ cm}$$

Exercise 14B

1. Area of rectangle = $l \times b$

(i) $25 \times 12 = 300 \text{ sq cm}$

(ii) $10 \times 8 = 80 \text{ m}^2$ or 80 sq m

(iii) $12.5 \times 6.5 = 81.25 \text{ sqm}$

(iv) $4.5 \times 2 = 9 \text{ sq km}$

2. Area of square = side $\times$ side

(i) $6 \times 6 = 36 \text{ cm}^2$

(ii) $4.2 \times 4.2 = 17.64 \text{ sq cm}$

(iii) $5.5 \times 5.5 = 30.25 \text{ sq cm}$

(iv) $90 \times 90 = 8100 \text{ sq cm}$

3. Playground Area = $l \times b$

$$675 = l \times b$$

$$\frac{675}{15} = l$$

$$l = 45 \text{ m}$$

4. Area of room = $l \times b$

$$\text{Length} = 500 + 40 \text{ cm} = 540 \text{ cm}$$

$$\text{Breadth} = 300 + 75 = 375 \text{ cm}$$

$$\text{Area of room} = \text{Area of carpet needed}$$

$$= 540 \times 375 = 202500 \text{ sq cm}$$

5. Perimeter = $2(l \times b)$

$$\text{Rectangular area} = l \times b$$

$$650 = l \times 13$$

$$50 = l$$

$$\text{Perimeter} = 2(50 + 13)$$

$$= 63 \times 2$$

$$= 126 \text{ cm}$$

6. (i) Length is double = $2l$

$$\text{Breadth is triple} = 3b$$

$$\begin{aligned}\text{Area} &= 2\ell \times 3b \\ &= 6\ell \times b\end{aligned}$$

6 times area of previous one.

(iii) length = 2ℓ

breadth = $2b$

$$\begin{aligned}\text{Area} &= 2\ell \times 2b \\ &= 4\ell b\end{aligned}$$

4 times area of previous rectangle.

$$\begin{aligned}7. \text{ Area of wall} &= \ell \times b \\ &= 4 \times 3 \\ &= 12 \text{ m}^2 \text{ or } 120000 \text{ sq cm}\end{aligned}$$

$$\begin{aligned}\text{Area of tile} &= 25 \times 20 \\ &= 500 \text{ sq cm}\end{aligned}$$

$$\text{No. of tile needed} = \frac{120000}{500}$$

$$= 240 \text{ tiles}$$

$$8. \text{ Area of park} = ₹2400 \div 5 = 480 \text{ sq m}$$

$$\text{Width of boundary} = 15 \text{ m}$$

$$\text{Length of boundary} = \frac{480}{15} = 32 \text{ m}$$

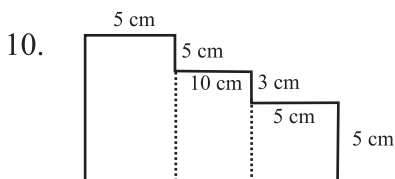
$$\text{Perimeter} = 2(\ell + b) = 2(32 + 15) = 94 \text{ m}$$

$$\text{Cost of making its boundary} = 94 \times 2.25$$

$$= ₹211 \text{ and } 50 \text{ paisa}$$

$$9. \text{ Number of bricks} = \frac{\text{Area of lane}}{\text{Area of one brick}} = \frac{180 \times 5 \times 100 \times 100}{20 \times 15}$$

$$\text{Cost of bricks} = \frac{30000 \times 750}{1000} = 22500$$



$$\begin{aligned}\text{Area of (1)} &= \ell \times b \\ &= 15 \times 5 = 75 \text{ sq cm}\end{aligned}$$

$$\begin{aligned}\text{Area of (2)} &= \ell \times b \\ &= 10 \times 10 = 100 \text{ sq cm}\end{aligned}$$

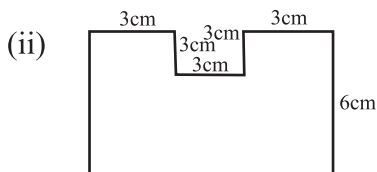
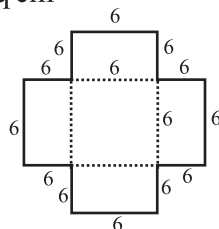
$$\text{Area of (3)} = 5 \times 5 = 25 \text{ sq cm}$$

$$\text{So, area of figure} = 75 + 100 + 25 = 200 \text{ sq cm}$$

11. (i) No of square formed are = 5

$$\text{And area of one} = 6 \times 6 = 36 \text{ sq cm}$$

$$\text{Total} = 36 \times 5 = 180 \text{ sq cm}$$



$$\begin{aligned}\text{Area of (1) and (3)} &= \ell \times b \\ &= 3 \times 6 = 18 \text{ sq cm}\end{aligned}$$

$$\text{Area of (2)} = \ell \times b = 3 \times 3 = 9 \text{ sq cm}$$

$$\text{So, area of fig.} = 18 + 18 + 9 = 45 \text{ sq cm}$$

Check Your Mental Math IQ

1. (a) Area will be four time

$$\begin{aligned}\text{As Area} &= (\text{side} \times \text{side}) \\ &= 2s \times 2s = 4s^2 \\ &= 4 \text{ times}\end{aligned}$$

- (b) Area well become 9 times

$$\begin{aligned}\text{as Aera} &= (s)^3 \\ &= 3s \times 3s = 9 \text{ times } (s)^2\end{aligned}$$

2. $2(\ell + b)$

3. Perimeter of sq = 32 cm

$$\text{Side} = 32 \div 4 = 8 \text{ cm}$$

$$\text{Area} = \text{side} \times \text{side}$$

$$= 8 \times 8 = 64 \text{ sq cm}$$

4. sqm, m

5. Area of panes = $25 \times 16 = 400 \text{ cm}^2$

$$12 \text{ panes area} = 400 \times 12 = 4800 \text{ cm}^2 \text{ or } 0.48 \text{ m}^2$$

6. Perimeter of square $= 4 \times s$

$$= 4 \times 36 = 144 \text{ m}$$

Perimeter of square = Perimeter of rectangle

$$144 = 2(\ell + b)$$

$$72 = \ell + 18$$

$$54 = \ell$$

Area of square $= (s)^2$

$$= (36)^2 = 1296 \text{ sq m}$$

Area of rectangle $= \ell \times b$

$$= 54 \times 18 = 972 \text{ sq m}$$

So, square is more by $= 1296 - 972 = 324 \text{ sq m}$

Multiple Choice Questions

1. (ii) Perimeter

2. (iv) Perimeter of square $= 4s$

$$40 = 4s$$

$$10 = s$$

(iv) 10

3. (i) Area $= \ell \times b$

if $\ell = 2\ell$

Then = Area $= 2\ell \times b = 2\ell b$

(i) double

4. Perimeter of square $= 4 \times s$

$$36 = 4 \times \text{side}$$

$$\frac{36}{4} = \text{side}$$

Side $= 9$

Area of square $= (s)^2$

$$= (9)^2 = 81$$

(i) 81 cm^2

5. (iv) 8 m

Area of rectangle

$$= \ell \times b$$

$$= 8 \times 6 = 48 \text{ cm}^2$$

Cut in 12 pieces so as $\text{area} = (s)^2$

$$(s)^2 = \frac{48}{12}$$

$$s = 2$$

$$\begin{aligned} \text{Perimeter} &= 4 \times s \\ &= 8 \text{ m} \end{aligned}$$

6. Area of square = 144

$$s^2 = 144$$

$$s = 12$$

$$\begin{aligned} \text{Perimeter} &= 4 \times s \\ &= 4 \times 12 = 48 \text{ m} \end{aligned}$$

or 4800 cm (ii)

$$7. S = \frac{s}{2}$$

$$\text{Area} \Rightarrow \frac{s \times s}{2 \times 2} = \frac{s^s}{4}$$

(iii) one fourth.

8. Area of a tile measure $12 \text{ cm} \times 10 \text{ cm} = 120 \text{ cm}^2$

Area of cover floor $3 \text{ m} \times 4 \text{ m} = 12 \text{ m}^2$ or 12000 cm^2

$$\begin{aligned} \text{No of tiles} &= \frac{120000}{120} = 1000 \left(\frac{\text{Area of floor}}{\text{Area of 1 tile}} \right) \\ &= 1000 \text{ tiles (i)} \end{aligned}$$

Exercise 15A

4. (i) Range (₹300–₹700)
(ii) one
(iii) three
5. 12, 8, 11

Exercise 15B

1. (i) 60 books
(iii) Tuesday
(v) Monday, Saturday
- (ii) Friday
(iv) 90 books
4. (i) A bar graph shows number of students and their shoe numbers.
(ii) 40 students
(iv) Shoe no 9, 65 students
- (iii) 35, shoe no 7
(v) 155 students
5. (i) 600 scooters
(iii) 100 scooters
(iv) January, 400 scooters
- (ii) 500 scooters

Check Your Mental Math IQ

1. Tally
2. Pictograph
3. Equal
4. Equal

Multiple Choice Questions

1. (i)
2. (iii)
3. (i)
4. (ii)

Notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

