1 Knowing Our Numbers

Exercise 1.1

1.

	Crores		Lakhs		Thousands		Ones		
	TC	C	TL	L	T TH	TH	H	T	O
(i)		9	5	0	3	5	2	0	6
(ii)		2	3	4	9	5	6	0	4
(iii)			3	0	7	0	5	0	9

2.

	Billions			Millions			Thousands			Ones		
	H. B.	T. B.	B	H. M.	T. M.	M	H.TH	T.TH	TH	H	T	O
(i)						5	7	2	3	4	5	6
(ii)					1	0	3	4	1	2	5	7
(iii)						3	7	2	5	6	9	8

3. (i) 8453765 = 8000000 + 400000 + 50000 + 3000 + 700 + 60 + 5

(ii) 57062319 = 50000000 + 7000000 + 60000 + 2000 + 300 + 10 + 9

(iii) 40010809 = 40000000 + 10000 + 800 + 9

4. (i) 13,45,609 = Thirteen lakh forty-five thousand six hundred nine

(ii) 9,99,99,999 = Nine crore ninety-nine lakh ninety-nine thousand nine hundred ninety-nine

(iii) 57,06,895 = Fifty-seven lakh six thousand eight hundred ninety-five.

5. (i) 578,346 = Five hundred seventy-eight thousand three hundred forty-six.

(ii) 7,952,346 = Seven million nine hundred fifty-two thousand three hundred forty-six

(iii) 2,335,678
= Two million three hundred thirty-five thousand six-hundred seventy-eight.

6. **Indian System :**

(i) 16,77,652

(ii) 29,27,25,387

(iii) 79,00,690

International System :

(i) 1,677,652

(ii) 292,725,387

(iii) 7,900,690

7. (i) 2,35,00,027

(ii) 62,00,005

(iii) 4,37,19,008

8. (i) 65,421

(ii) 8,70,543

(iii) 3,60,95,737

(iv) 10,206

9. (i) 6,87,90,456 > 68,78,345

(ii) 8,94,098 > 89,409

(iii) 8,20,45,899 = 8,20,45,899

(iv) 41,03,678 < 4,61,03,678

10. (i) Successor of 70,00,000
= 70,00,000 + 1 = 70,00,001

(ii) Successor of 83,24,000
= 83,24,000 + 1 = 83,24,001

(iii) Successor of 45,68,909
= 45,68,909 + 1 = 45,68,910

(iv) Successor of 61,00,000
= 61,00,000 + 1 = 61,00,001

11. (i) Predecessor of 64,05,789
= 64,05,789 – 1 = 64,05,788

(ii) Predecessor of 9,99,99,999
= 9,99,99,999 – 1 = 9,99,99,998

(iii) Predecessor of 9,25,999
= 9,25,999 – 1 = 9,25,998

(iv) Predecessor of 10,00,000
= 10,00,000 – 1 = 9,99,999

12. (i) 13,43,678 ; 13,44,678 ; 13,45,678; 13,46,678 ; 13,47,678

(ii) 40,20,300 ; 40,30,400 ; 40,40,500 ; 40,50,600 ; 40,60,700

13. Greatest 6 digit number = 999999
Greatest 7 digit number = 9999999
Total number of 7 digit numbers
= 9999999 – 999999 = 9000000

14. (i) Greatest 7-digit number by using digits 2, 9, 4, 1, 5, 7, 3
Once is 97,54,321
Smallest 7 digit number by using digits 2,9,4,1,5,7,3
Once is 12,34,579

(ii) Greatest 7-digit number by using digits 4,5,0,6,2,1,8
Once is 86,54,210
Smallest 7-digit number by using digits 4,5,0,6,2,1,8
Once is 10,24,568

15.

	Greatest number	Smallest number
(i)	27,09,835	7,63,048
(ii)	3,68,92,173	12,37,689

Exercise 1.2

1. (i) In 2934, the digit at the hundreds place is 9
Hence 2934 rounded off to nearest thousand 3000.

(ii) In 3764, the digit at the hundreds place is 7
Hence 3764 rounded off the nearest thousand 4000.

(iii) In 7951, the digit at the hundreds place is 9
Hence 7951 rounded off the nearest thousand 8000.

2. (i) In 585856, the digit at the thousand place is 5
Hence 585856 rounded off the nearest thousand 590000.

(ii) In 89132, the digit at the thousand place is 9
Hence 89132 rounded off the nearest thousand 90000.

(iii) In 183246, the digit at the thousand place is 3.
Hence 183246 rounded off the nearest thousand 180000.

3. (i) In 165263, the digit at ten thousand place is 6
Hence 165263 rounded off the nearest lakhs 200000.

(ii) In 254305, the digit at the ten thousand place is 5
Hence 254305 rounded off the nearest lakhs 300000.

(iii) In 2639215, the digit at the ten thousand place is 3.
Hence 2639215 rounded off the nearest lakhs 2600000.

4. Difference between 56735 and 62542
= 62542 – 56735 = 5807
56735 estimated to nearest thousand
= 57000
62542 estimated to nearest thousand
= 63000
∴ required estimation = 63000 – 57000
= 6000.

5. According to the questions ;
Rounding the first number up
46 is round to 50
Rounding the second number down
88 is rounded to 80
Estimated product = $50 \times 80 = 4000$

6. (i) $63 \div 29$
63 estimated to nearest ten = 60
29 = 30
∴ Required estimation = $(60 \div 30)$
= 2

(ii) $2698 \div 61$
2698 estimated to nearest thousand
= 3000
61 estimated to nearest ten = 60
∴ Required estimation
= $(3000 \div 60) = 50$.

7. 31750 + 47807 + 12397
31750 estimated to nearest thousand
= 32000
47807 estimated to nearest thousand
= 48000
12397 estimated to nearest thousand
= 12000
Required estimation
= 32000 + 48000 + 12000 = 92000

8. (i) 3655 + 498
3655 estimated to nearest thousand
= 4000
498 estimated to nearest hundred
= 500
Required estimation
= 4000 + 500 = 4500

(ii) 2894 + 6873 + 1350
2894 estimated to nearest thousand = 3000
6873 estimated to nearest thousand = 7000
1350 estimated to nearest thousand = 1000
Required estimation
= 3000 + 7000 + 1000 = 11000

(iii) 7006 – 3864
7006 estimated to nearest thousand = 7000
3864 estimated to nearest thousand = 4000
Required estimated 7000 – 4000 = 3000

(iv) 863 – 534
863 estimated to nearest hundred = 900
534 estimated to nearest hundred = 500
Required estimation
= 900 – 500 = 400

(v) 7347 – 2167
7347 estimated to nearest thousand = 7000
2167 estimated to nearest thousand = 2000
Required estimation
= 7000 – 2000 = 5000

9. (i) 25 × 73
25 estimated to nearest ten = 30
73 estimated to nearest ten = 70
Estimated product = 30 × 70 = 2100

(ii) 491 × 421
491 estimated to nearest hundred = 500
421 estimated to nearest hundred = 400
Estimated product
= 500 × 400 = 200000

(iii) 659 × 34
659 estimated to nearest hundred = 700
34 estimated to nearest ten = 30
Estimated product
= 700 × 30 = 21000

10. Quantity of sugar = 568 kg
Quantity sells in every day = 48 kg
Quantity sells in 8 days = 48 × 8 = 384 kg
Left sugar = (568 – 384) kg = 184 kg.
184 estimated to nearest hundred = 200 kg.

11. Number of student going for a picnic = 355
Number of students that can sit in a bus = 62
Estimated to total number of students = 360
Estimated students that can sit in a bus = 60
Required buses to take the students
= 360 ÷ 60 = 6

12. Number of coins in a red bag = 1712
Number of coins in a green bag = 1238
1712 estimated to nearest hundred = 1700
1238 estimated to nearest hundred = 1200
Total estimated number = 1700 + 1200
= 2900

Exercise 1.3

1. (i) 59 = LIX
(ii) 95 = XCV
(iii) 324 = CCCXXIV
(iv) 67 = LXVII
(v) 447 = CDXLVII

2. (i) LXXXIII = 83
(ii) XCV = 95
(iii) CDLXV = 465
(iv) MDCLIV = 1654
(v) CCXLIX = 249

3. (i) LV > XL
(ii) LXXI > XLIX
(iii) XLIV < LXIV
(iv) XC > XL

4. (i) XXXV + XL
= 35 + 40 = 75 = LXXV
(ii) LIX + XI
= 59 + 11 = 70 = LXX
(iii) XL + XXX = 40 + 30 = 70 = LXX
(iv) L – XXXIX = 50 – 39 = 11 = XI
(v) XCII – LXV
= 92 – 65 = 27 = XXVII

5. (i) LVII = Meaningful
(ii) VXVIII = Meaningless
(iii) CLXXXX = Meaningless
(iv) LCLXIV = Meaningful
(v) MVXV = Meaningful

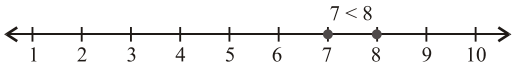
6. (i) (a) (ii) (b) (iii) (c) (iv) (a) (v) (c)

2 Whole Numbers

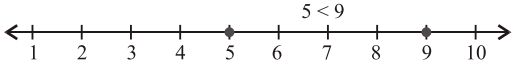
Exercise 2.1

1. All whole number is the ascending order which lie between 858 and 878 are 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877.

2. Draw a number line and show the given numbers by a dot as shown below :
As 7 is the left to 8 are 8 is to right of 7
So, 8 is greater than 7. 7 is less than 8.



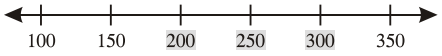
3. Draw a number line and show the given numbers by a dot as shown below :
As 5 is the left to 9 or 9 is to right of 5
So, 9 is greater than 5. 5 is less than 9.



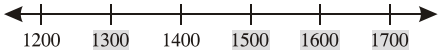
4. Four consecutive whole numbers
= 310097, 310098, 310099, 310100

5. (i)

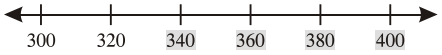
(ii)



(iii)



(iv)



6. (i) 609 + 448 + 391
= (609 + 391) + 448
= 1000 + 448 = 1448
(ii) 311 + 484 + 189 + 4116
= (311 + 189) + (484 + 4116)
= 500 + 4600 = 5100

7. (i) True (ii) False (iii) False (iv) True
(v) True

8. (i) 696 + 59 = **59** + 696
(ii) 146 + 35 + 854 = 35 + (**854** + 146)

9. Sum of numbers in vertical row
= 2 + 7 + 6 = 15
Completer second column by putting
= {15 – (9 + 1)} = 5
Complete 1st row by putting
= {15 – (9 + 2)} = 4
Complete 2nd row by putting
= {15 – (5 + 7)} = 3

2	9	④
7	⑤	③
6	1	8

Sum of number in second column
= (9 + 7 + 5) = 21
Column the diagonal row
= 21 – (8 + 7) = 6
Complete the second diagonal row
= 21 – (4 + 7) = 10
Complete 1st row by putting
= 21 – (8 + 10) = 3
3rd row by putting
= 21 – (+ 6) = 10

8	9	4
③	7	11
⑩	5	⑥

Sum of number in second horizontal
= 10 + 6 + 2 = 18
Complete the 2nd column
= 18 – (6 + 8) = 4
Complete the 1st column with 5 and 3
Completer the 3rd column with 9 and 7

⑤	④	⑨
10	6	2
③	8	⑦

Exercise 2.2

1. (i) 1958 – 987 = 971
Check : 1958 – 987 = 971
and 971 + 987 = 1958
(ii) 21543 – 18009 = 3534
Check : 21543 – 18009 = 3534
and, 18009 + 3534 = 21543

(iii) 999999 – 8899 = 991100
Check : 999999 – 8899 = 991100
and 991100 + 8899 = 999999

(iv) 4030201 – 90725 = 393476
Check : 393476 + 90725 = 4030201

2. (i) 38725 – **36788** = 1937

(ii) **9091** – 8952 = 139

(iii) 100028 – 59992 = **40036**

(iv) 3956 – 956 – **2950** = 50

3. The greatest 5-digit number = 99999
The smallest 5-digit number = 10000
difference between then
= 99999 – 10000 = 89999.

4. Kajal had money = ₹ 5482
She bought a table = ₹ 2926
Money left = ₹ (5482 – 2926) = ₹ 2556

5. Swati deposited in a bank = ₹ 10000
Total money withdraw
= ₹ (2845 + 3147 + 940) = ₹ 6932
Account balance = ₹ (10000 – 6932)
= ₹ 3068

6. $a = 723, b = 236$ and $c = 209$

$$a - (b - c) \neq (a - b) - c$$
$$\text{LHS} \neq \text{RHS}$$
$$723 - (236 - 209) \neq (723 - 236) - 209$$
$$723 - 27 \neq 487 - 209$$
$$696 \neq 278$$

7. 6758 + 456 = 7214
7214 – 456 = 6758
7214 – 6758 = 456

Exercise 2.3

1. (i) 4 × 1629 × 25
= (25 × 4) × 1629
= 100 × 1629
= 162900

(ii) 8 × 125 × 368
= (125 × 8) × 368
= 1000 × 368
= 368000

(iii) 250 × 125 × 4 × 8
= (250 × 4) × (125 × 8)
= 1000 × 1000
= 1000000

(iv) 1693 × 482 × 0 × 18 = 0

2. (i) 964 × 72 = **72** × 964

(ii) 352 × **39** = 39 × 352

(iii) 20 × 50 × **10** = 10000

3. (i) 927 × 475
= 927 × (500 – 25)
= 927 × 500 – 927 × 25
= 463500 – 23175
= 440325

(ii) 42813 × 672
= 42813 × (680 – 8)
= 42813 × 680 – 42813 × 8
= 29112840 – 342504
= 28770336

4. (i) 394 × 49
= 394 × (50 – 1)
= 394 × 50 – 394
= 19700 – 394
= 19306

(ii) 463 × 198
= 463 × (200 – 2)
= 463 × 200 – 463 × 2
= 92600 – 926
= 91674

(iii) 52 × 187
= 52 × (190 – 3)
= 52 × 190 – 52 × 3
= 9880 – 156
= 9724

(iv) 57318 × 202
= 57318 × (200 + 2)
= 57318 × 200 + 57318 × 2
= 11463600 + 114636
= 11578236

5.

×	1	3	5	7
1	1	3	5	7
3	3	9	15	21
5	5	15	25	35
7	7	21	35	49

×	2	4	6	8
2	4	8	12	16
4	8	16	24	32
6	12	24	36	48
8	16	32	48	64

×	1	3	5	7
2	2	6	10	14
4	4	12	20	28
6	6	18	30	42
8	8	24	40	56

(i) The product of two odd numbers is always an **odd** number.

(ii) The product of two even numbers is always an **even** number.

(iii) The product of an odd number and an even number is always an **even** number.

6. Greatest 4 digit number = 9999
Smallest 3 digit number = 100
9999 × 100 = 100 × 9999
(closure property)
999900 = 999900

According to the closure property of multiplication the product of two whole number is always a whole number.
Now, Greatest 4 digit number
= 9999 (It is a whole number)
and Smallest 3 digit number
= 100 (It is also a whole number)
Product = 9999 × 100 = 999900
(It is also a whole number)
∴ The property is verified.

7. y is a whole number.
$y = 1$
$y \times y = y$
$1 \times 1 = 1$
yes, 1 is a whole number.

8. (i) $185 \times 3 + 7 \times 185$
$= 185 \times (3 + 7)$
$= 185 \times 10 = 1850$
(ii) $127 \times 48 + 127 \times 2$
$= 127 \times (48 + 2)$
$= 127 \times 50 = 6350$
(iii) $53 \times 694 - 39 \times 694 - 4 \times 694$
$= 694 (53 - 39 - 4)$
$= 694 (53 - 43) = 694 \times 10 = 6940$
(iv) $12345 \times 167 - 52 \times 12345 - 12345 \times 15$
$= 12345 (167 - 52 - 15)$
$12345 (167 - 67) = 12345 \times 100$
$= 1234500$

9. Number of maths books = 32
Cost of a maths books = ₹ 29
Total cost of maths books
= ₹ (32 × 29) = ₹ 928
Number of science books = 32
Cost of a science book = ₹ 21
Total cost of science book
= ₹ (32 × 21) = ₹ 672
Teacher pay to shopkeeper
= ₹ (928 + 672) = ₹ 1600

10. Number of computers sold = 234
Collection of each computer = ₹ 41385
Total collection = ₹ (234 × 41385)
= ₹ 9684090

11. Greatest number of 4-digit = 9999
Smallest number of 5-digit = 10000
Product of these number
9999 × 10000 = 9990000.

12. Petrol filled in car on Monday = 20l
Petrol filled in car on Tuesday = 40l
Total petrol filled = (20 + 40) l = 60 l
Cost of 1 l petrol = ₹ 44
Cost of 60 l petrol = ₹ 44 × 60 = ₹ 2640

Exercise 2.4

1. (i) $744807 \div 87$

$$\begin{array}{r} 8561 \\ 87\overline{)744807} \\ -696 \\ \hline 488 \\ 435 \\ \hline 530 \\ 522 \\ \hline 87 \\ 87 \\ \hline 0 \end{array}$$

Check : Divided = D × Q + R
744807 = 87 × 8561 + 0 = 744807

(ii) $36032 \div 64$

$$\begin{array}{r} 563 \\ 64\overline{)36032} \\ -320 \\ \hline 403 \\ 384 \\ \hline 192 \\ 192 \\ \hline 0 \end{array}$$

Check : Divided = D × Q + R
36032 = 64 × 563 + 0 = 36032

(iii) $20878 \div 286$

$$\begin{array}{r} 73 \\ 286\overline{)20878} \\ -2002 \\ \hline 858 \\ 858 \\ \hline 0 \end{array}$$

Check : Divided = D × Q + R
20878 = 286 × 73 + 0 = 20878

(iv) $11711 \div 239$

$$\begin{array}{r} 49 \\ 239\overline{)11711} \\ 956 \\ \hline 2151 \\ 2151 \\ \hline 0 \end{array}$$

Check : Divided = D × Q + R
11711 = 239 × 49 + 0
= 239 × 49 = 11711

2. (i) 462359 ÷ 263

$$\begin{array}{r} 263\overline{)462359(}\,1758 \\ \underline{263} \\ 1993 \\ \underline{1841} \\ 1525 \\ \underline{1315} \\ 2109 \\ \underline{2104} \\ 5 \end{array}$$

Check : Divided = D × Q + R
462359 = 263 × 1758 + 5
= 462354 + 5 = 462359

(ii) 88756 ÷ 59

$$\begin{array}{r} 59\overline{)88756(}\,1504 \\ \underline{59} \\ 297 \\ \underline{295} \\ 256 \\ \underline{236} \\ 20 \end{array}$$

Check : Divided = D × Q + R
88756 = 59 × 1504 + 20
= 88736 + 20 = 88756

(iii) 762218 ÷ 82

$$\begin{array}{r} 82\overline{)762218(}\,9295 \\ \underline{738} \\ 242 \\ \underline{165} \\ 782 \\ \underline{738} \\ 448 \\ \underline{410} \\ 38 \end{array}$$

Check : Divided = D × Q + R
762218 = 82 × 9295 + 38
= 762180 + 38 = 762218

(iv) 1112113 ÷ 476

$$\begin{array}{r} 476\overline{)1112113(}\,2336 \\ \underline{952} \\ 1601 \\ \underline{1428} \\ 1731 \\ \underline{1428} \\ 3053 \\ \underline{2856} \\ 177 \end{array}$$

Check : Divided = D × Q + R
1112113 = 476 × 2336 + 177
= 1111936 + 177 = 1112113

3. (i) 0 ÷ 836 = 0
(ii) 49272 ÷ 1 = 49272
(iii) 730 ÷ 73 – 10 = 10 – 10 = 0
(iv) 999 + 635 ÷ 635
= 999 + (635 ÷ 635)
= 999 + 1 = 1000
(v) 1826 + 100 ÷ 25
= 1826 + (100 ÷ 25)
= 1826 + 4 = 1830
(vi) 60 × 101 – 360 ÷ 6
= 6060 – 60 = 6000
(vii) (82369 ÷ 287) ÷ 287
= 287 ÷ 287 = 1
(viii) (40 × 80) – 1600 ÷ 20
3200 – 80 = 3120

4. To get required number, first we divide 1000 by 48
Then subtract the remainder form the divisor.

$$\begin{array}{r} 48\overline{)1000(}\,20 \\ -\,960 \\ \underline{\quad} \\ 40 \end{array}$$

required number is 40
100 – 40 = 960
∴ 960 ÷ 48 = 20

5. To get required number first we divided 1200 by 52

$$\begin{array}{r} 52\overline{)1200(}\,23 \\ -\,104 \\ \underline{\quad} \\ 160 \\ \underline{156} \\ 4 \end{array}$$

Hence the required number 52 – 4 = 48

∴ 1200 + 48 = 1248

1248 ÷ 52 = 24

6. (i) Largest 5-digit number = 99999

$$115\overline{)99999}(869$$

$$\begin{array}{r} 920 \\ \hline 799 \\ 690 \\ \hline 1099 \\ 1035 \\ \hline 64 \end{array}$$

Largest 5-digit number divisible by 115

∴ 99999 – 64 = 99935

(ii) Least 5 digit number = 10000

$$115\overline{)10000}(86$$

$$\begin{array}{r} -\,920 \\ \hline 800 \\ 690 \\ \hline 110 \end{array}$$

∴ Least number to be added to 10000

To make it divisible by 115

= Divisor – Remainder

= 115 – 110 = 5

∴ 10000 + 5 = 10005

10005 is lest 5 digit number divisible by 115.

7. Greatest 6 digit number = 999999

Smallest 4 digit number = 1000

999999 ÷ 1000

$$1000\overline{)9999999}(999$$

$$\begin{array}{r} 9000 \\ \hline 9999 \\ 9000 \\ \hline 9999 \\ 9000 \\ \hline 999 \end{array}$$

Quotient = 999 ; remainder = 999.

8. Smallest 5-digit number = 10000

Greatest 2-digit number = 99

$$99\overline{)10000}(101$$

$$\begin{array}{r} 99 \\ \hline 100 \\ 99 \\ \hline 1 \end{array}$$

Quotient = 101; remainder = 1

9. Cost of 28 desks = ₹ 153944

Cost of 1 desk = ₹ 153944 ÷ 28

$$28\overline{)153944}(5498$$

$$\begin{array}{r} 140 \\ \hline 139 \\ 112 \\ \hline 274 \\ 252 \\ \hline 224 \\ 224 \\ \hline 0 \end{array}$$

Thus cost of 1 desk is ₹ 5498.

10. Total amount = ₹ 1,31,750

Number of worker = 125

One worker received money

₹ (131750 ÷ 125) = ₹ 1054

11. Number of TATA cars = 178

A dealer collected = ₹ 43752400

Cost of each car = ₹ (43752400 ÷ 178)

= ₹ 245800

12. Number of states = 16

Oil company releases oil = 584624 *l*

All state receive oil = (584624 ÷ 16) *l*

= 36539 *l*

MCQs

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

Mental Maths

1. Fill in the blanks :

(i) 9999 = 9999 + **0**

(ii) 8273 – **0** = 8273

(iii) 27304 + 1532 = **1532** + 27304

(iv) 500 + (**196** + 381) = (**500** + 196) + 381

2. Multiplicative identity for whole number is **1** .

3. The whole number which is not used as a divisor is **0** .

4. Whole numbers are not closed under **Subtraction** and **division** .
5. The predecessor of 1 is the smallest **whole** number.
6. $3\times(9\times10)=(3\times9)\times10$ shows that the multiplication of whole number is **Associative** .

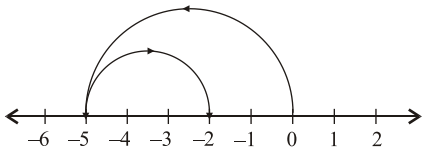
3 Integers

Exercise 3.1

1. (i) Loss of ₹ 135
(ii) Go to west
(iii) Deposit of money in bank.
(iv) Decreasement of temperature.
(v) $10°C$ below zero.
(vi) Going 35 km to North.

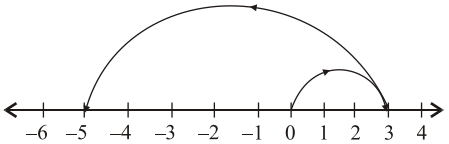
2. (i) 10 degree below freezing point $=-10$
(ii) A gain of ₹ 250 $=+$ ₹ 250
(iii) 40 degree north latitude $=+40°$
(iv) A withdrawl of ₹ 1000 $=-$ ₹ 1000
(v) A descent of 50 metres $=-50$ m
(vi) 4,500 ft. above sea level
$=+4500$ ft

3.



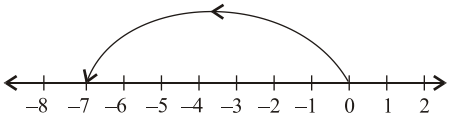
(i) First 5 units left than 3 unit right
$\therefore$ 3 more than -5 is -2

(ii) 8 less than 3



First move 3 unit to right then move 8 units to left
$\therefore$ 8 less than 3 is -5

(iii) 7 less than 0

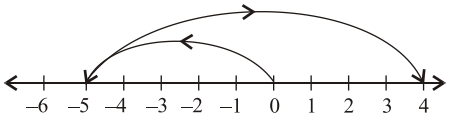


Move 7 unit left of zero
$\therefore$ 7 less than 0 is -7

(iv) 5 less than 13

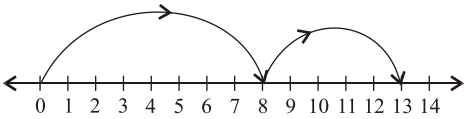
First move 13 unit right of zero than 5 unit left
$\therefore$ 5 less than 13 is 8

(v) 9 more than -5



First move 5 units to left of zero then 9 unit to right
$\therefore$ 9 more than -5 is 4

(vi) 5 more than 8



First move 8 unit to right of zero than 5 unit to right
$\therefore$ 5 more than 8 is 13

4. (i) $|27|=27$ (ii) $|-23|=23$
(iii) $|0|=0$ (iv) $|-17|=17$
(v) $|-248|=248$ (vi) $|124|=124$
(vii) $|-150|=150$ (viii) $|240|=240$

5. (i) $5+|-8|$
$=5+8$
$=13$

(ii) $|135-17|$
$=|118|$
$=118$

(iii) $8-|-5|$
$=8-5$
$=3$

(iv) $|9|+|-3|$
$=9+3$
$=12$

(v) $|-5|+|-3|$
$=5+3$
$=8$

(vi) $-|-19|$
$=-19$

6. (i) $0 > (-3)$
(ii) $-75 < 67$
(iii) $(-20) < 20$
(iv) $(-125) > (-521)$
(v) $11 > (-101)$
(vi) $52 > (-52)$

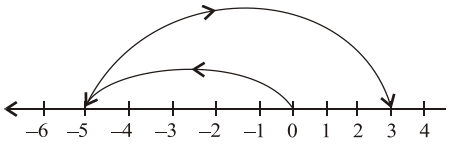
7. (i) False (ii) False (iii) True
(iv) False (v) False.

8. Wednesday is coldest
Maximum temperature was on Monday.

9. (i) If point D is –6 then A is +6
(ii) A is a positive integer.
(iii) Integers from B to E (4, 3, 2, 1, 0 –1, –2)
(iv) The point on the number line least value is D.
(v) Increasing order = D < K < O < C < B < A.
(vi) C is represented +2

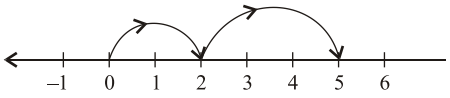
Exercise 3.2

1. (i) $-5 + 8$



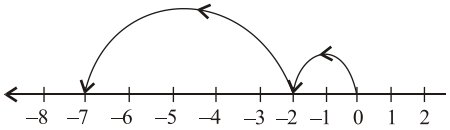
First move 5 units left of zero then 8 units to right
$\therefore \quad -5 + 8 = 3$

(ii) $2 + 3$



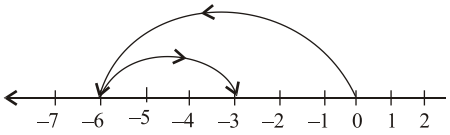
First move 2 units right of zero then 3 unit to right of it
$\therefore \quad 2 + 3 = 5$

(iii) $(-2) + (-5)$



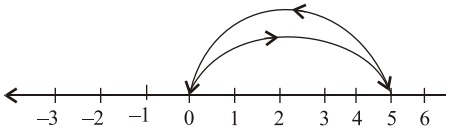
First move 2 units to left of zero then 5 units to left of it
$\therefore \quad (-2) + (-5) = -7$

(iv) $(-6) + 3$



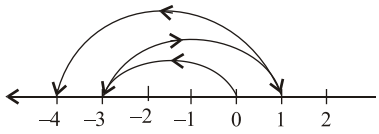
First move 6 units to left of zero then 3 units right of it
$\therefore \quad (-6) + 3 = -3$

(v) $5 + (-5)$



First move 5 units to right of zero then 5 units left of it
$\therefore \quad 5 + (-5) = 0$

(vi) $(-3) + 4 + (-5)$



First move 3 units to left of zero then 4 unit right of it then 5 units left of it
$\therefore \quad (-3) + 4 + (-5) = -4$

2. (i) $88 + (-200)$
$= 88 - 200$
$= -112$

(ii) $-245 + 110$
$= -135$

(iii) $3155 + (-3155)$
$= 3155 - 3155$
$= 0$

(iv) $1432 + (-1222)$
$= 1432 - 1222$
$= 210$

(v) $-510 + (-215)$
$= -510 - 215$
$= -725$

(vi) $(-2322) + (-2178)$
$= -2322 - 2178$
$= -4500$

3. (i) Additive inverse of $0 = 0$

(ii) Additive inverse of $27 = -27$

(iii) Additive inverse of $1 = -1$

(iv) Additive inverse of $= 100 = -100$

(v) Additive inverse of $-435 = 435$

(vi) Additive inverse of $-35 = 35$

4. (i) $\{155 + 274\} + (-324)$

$= 429 + (-324)$

$= 429 - 324$

$= 105$

(ii) $\{-275 + 193\} + 201$

$= -82 + 201$

$= 119$

(iii) $\{32 + (-42)\} + \{(-54) + 273\}$

$= \{32 - 42\} + \{-54 + 273\}$

$= \{-10\} + \{219\}$

$= -10 + 219$

$= 209$

(iv) $1101 + (-1011) + 1111 + (-1010)$

$= \{1101 + 1111\}$

$+ \{-1011 - 1010\}$

$= 2212 + \{-2021\}$

$= 2212 - 2021$

$= 191$

5. (i) Predecessor of $0 = 0 - 1 = -1$

(ii) Predecessor of $-121 = -121 - 1$

$= -122$

(iii) Predecessor of $13 = 13 - 1 = 12$

(iv) Predecessor of $1 = 1 - 1 = 0$

6. (i) Successor or of $-31 = -31 + 1$

$= -30$

(ii) Successor of $-1 = -1 + 1 = 0$

(iii) Successor of $0 = 0 + 1 = 1$

(iv) Successor of $-201 = -201 + 1$

$= -200$

7. (i) False (ii) False (iii) True

(iv) False (v) False.

Exercise 3.3

1. (i) Subtract 5 from –13

–13 – 5 = –18

(ii) Subtract –13 from 25

25 – (–13) = 25 + 13 = 48

(iii) Subtract –6 from 16

16 – (–6) = 16 + 6 = 22

(iv) Subtract –51 from 55

= 55 – (–51)

= 55 + 51 = 106

(v) Subtract 75 from –10

= –10 – 75 = –85

(vi) Subtract 45 from –50

= –50 – 45 = –95

2. (i) $(-10) + \mathbf{10} = 0$

(ii) $48 + (-\mathbf{48}) = 0$

(iii) $69 + (-69) = \mathbf{0}$

(iv) $-27 + \mathbf{40} = 13$

(v) $-\mathbf{3} - 17 = -20$

3. (i) $(-14) + (-4) \square (-12) + 5$

$-14 - 4 = -12 + 5$

$-16 = -7$

$-16 \boxed{<} -7$

(ii) $-139 + (11) \square (11) - (-39)$

$-139 + 11 = 11 + 39$

$-128 = 50$

$-128 \boxed{<} 50$

(iii) $7 - (-5) \square -5 - (-7)$

$7 + 5 = -5 + 7$

$12 = 2$

$12 \boxed{>} 2$

(iv) $25 - (7) \square 7 - 25$

$25 - 7 = 7 - 25$

$18 = -18$

$18 \boxed{>} -18$

4. (i) $(-20) + \mathbf{20} = 0$

(ii) $80 + \mathbf{(-80)} = 0$

(iii) $51 + (-69) = \mathbf{-18}$

(iv) $-27 + \mathbf{8} = -19$

(v) $\mathbf{-3} - 17 = -20$

5. (i) $47 - (-23) - 70$

$= 47 + 23 - 70$

$= 70 - 70 = 0$

(ii) $-115 + (-220) - 52$

$= -115 - 220 - 52$

$= -387$

(iii) $2 + (-30) + 15 - 12 + (-18) - (-3)$

$= 2 - 30 + 15 - 12 - 18 + 3$

$= 2 + 15 + 3 - 30 - 12 - 18$

$= 20 - 60 = -40$

(iv) $14 - (-7) + 9 + (-8) - (-11) + 5 - 2$

$= 14 + 7 + 9 - 8 + 11 + 5 - 2$

$= 14 + 7 + 9 + 11 + 5 - 8 - 2$

$= 46 - 10 = 36$

(v) $1-3+6-(-5)+(-4)+3$
$-(-12)+(-1)+27$
$=1-3+6+5-4+3+12-1+27$
$=1+6+5+3+12+27-3-4-1$
$=54-8$
$=46$

6. Let other integer be x
$\therefore \quad x+(-325)=1925$
$x=1925+325$
$x=2250$
$\therefore$ Other number is 2250.

7. We have to find
$=5340-\{3428+(-2022)\}$
$=5340-(3428-2022)$
$=5340-1406$
$=3934$

8. We have to find
$=[1250+(-3025)]-(-99)$
$=[1250-3025]+99$
$=-1775+99$
$=-1676$

9. We have to find
$=921-(225+325)$
$=921-550$
$=371$

10.

–	1	2	3	0	–1	–2	–3
–1	–2	–3	–4	–1	0	1	2
–2	–3	–4	–5	–2	–1	0	1
–3	–4	–5	–6	–3	–2	–1	0
0	–1	–2	–3	0	1	2	3
1	0	–1	–2	1	2	3	4

Exercise 3.4

1. (i) $15\times 199-15\times 99=15\times(199-99)$
distributive law
$=15\times 100$
$=1500$

(ii) $325\times(-58)+(-325)\times 42$
$=325\times(-58-42)$
$=325\times -100$
$=-32500$

(iii) $(-169)\times(-326)+(-169)\times(-74)$
$=-169\times(-326-74)$
distributive law
$=-169\times -400$
$=+67600$

(iv) $635\times 499-(-635)$
$=635\times 499+635$
$=635\times(499+1)$
distributive law
$=635\times 500=317500$

(v) $1765\times(-4)+(-1765)\times 96$
$=1765\times(-4-96)$
distributive law
$=1765\times(-100)$
$=-176500$

(vi) $31\times(-5)-(-5)\times 47+89(-5)$
$-(-27)\times(-5)$
$=(-5)\times[31-47+89-(-27)]$
distributive law
$=(-5)\times[31-47+89+27]$
$=-5\times[147-47]$
$=-5\times 100=-500$

2. (i) $(-72)\times(-45)=+3240$
(ii) $15\times(-36)=-540$
(iii) $(-52)\times(-78)=+4056$
(iv) $(-220)\times(-92)=+20240$
(v) $(-130)\times(-65)=+8450$
(vi) $2\times(-18)\times(5)=-180$
(vii) $(-4)\times(5)\times(-47)$
$=-20\times -47=940$
(viii) $\{(-1)\times(-3)\}\times\{(-5)\times(-7)\}$
$=(3)\times(35)=105$
(ix) $(-2)\times(-4)\times(-6)\times(-8)\times(-10)$
$=8\times(-6)\times 80$
$=-48\times 80$
$=-3840$

3. (i) (-250) is the integer whose product with (-1) is 250
(ii) 1740 is the integer whose product with (-1) is -1740
(iii) 2001 is the integer whose product with (-1) is -2001
(iv) (-2050) is the integer whose product with (-1) is 2050

4. (i) $(-1)^6\times(1)^{18}$
(+ ve integer) × (+ ve integer)
we get +ve

(ii) $(-1)^{299} \times (1)^{12}$

(– ve integer) × (+ ve integer)

– ve integer

5. (i) True (ii) False (iii) True (iv) False

6.

X	–3	–2	–1	0	1	2	3
–3	9	6	3	0	–3	–6	–9
–2	6	4	2	0	–2	–4	–6
–1	3	2	1	0	–1	–2	–3
0	0	0	0	0	0	0	0
1	–3	–2	–1	0	1	2	3
2	–6	–4	–2	0	2	4	6
3	–9	–6	–3	0	3	6	9

Exercise 3.5

1. (i) $396 \div 396 = 1$

(ii) $-2025 \div (-1) = 2025$

(iii) $0 \div 139 = 0$

(iv) $-256 \div 128 = -2$

(v) $-867 \div 867 = -1$

(vi) $3205 \div 3205 = 1$

2. (i) $(-35) \div (-5) = 7$

$(-35) = 7 \times -5$

$(-35) = -35$ **True**

(ii) $0 \div 5 = 0$

$0 = 0 \times 5$

$0 = 0$ **True**

(iii) $(-81) \div 9 = 9$

$(-81) \neq 9 \times 9$

$-81 \neq 81$ **False**

(iv) $13 \div (-1) = -13$

$13 = -13 \times -1$

$13 = 13$ **True**

(v) $132 = 0 \times 0$

$132 \neq 0$ **False**

(vi) $149 \div 1 = 149$

$149 = 149 \times 1$

$149 = 149$ **True**

3. (i) $(-65) \div (-13) = 5$

(ii) $(42) \div (-7) = -6$

(iii) $(-136) \div 17 = -8$

(iv) $0 \div (-13) = 0$

(v) $-1728 \div 12 = -144$

(vi) $(-15625) \div 125 = -125$

(vii) $(-512) \div (-8) = +64$

(viii) $1039 \div 1 = 1039$

(ix) $3000 \div (-1000) = -3$

Exercise 3.6

1. (i) $2 \times 2 \times 2 \times 2 = 2^4$

(ii) $(-7) \times (-7) \times (-7) \times (-7) \times (-7)$

$= (-7)^5$

(iii) $(-14) \times (-14) \times (-14) \times (-14)$

$\times (-14) \times (-14) = (-14)^6$

(iv) $(-1) \times (-1) \times (-1) = (-1)^3$

2.

	base	exponent
(i)	7	4
(ii)	–2	5
(iii)	–1	2
(iv)	14	1
(v)	5	10
(vi)	–35	3

3. (i) Square of 37

$= 37^2 = 37 \times 37 = 1369$

(ii) Square of -23

$= (-23)^2 = -23 \times -23 = 529$

(iii) Square of 17

$= 17^2 = 17 \times 17 = 289$

(iv) Square of -18

$= (-18)^2 = -18 \times -18 = 324$

4. (i) Cube of

$12 = 12^3 = 12 \times 12 \times 12$

$= 144 \times 12 = 1728$

(ii) Cube of -15

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

$= 225 \times -15$

$= -3375$

(iii) Cube of 1000

$= (1000)^3 = 1000 \times 1000 \times 1000$

$= 1000000 \times 1000$

$= 1000000000$

(iv) Cube of -11

$=(-11)^3=-11\times-11\times-11$

$=121\times-11$

$=-1331$

5. (i) $15^2=15\times15=225$

(ii) $50^3=50\times50\times50=125000$

(iii) $(-2)^6=-2\times-2\times-2\times-2\times-2\times-2=+64$

(iv) $(-5)^4=-5\times-5\times-5\times-5=+625$

(v) $(-7)^3=-7\times-7\times-7=-343$

(vi) $(-9)^3=-9\times-9\times-9=-729$

(vii) $(-3)^7=-3\times-3\times-3\times-3\times-3\times-3\times-3=-2187$

(viii) $(-1)^{63}=(-1)^{\text{odd}}=-1$

(ix) $(-1)^{84}=(-1)^{\text{even}}=1$

(x) $1^{100}=1$

(xi) $(-41)^2=-41\times-41=1681$

(xii) $(100)^3=100\times100\times100=1000000$

6. (i) $2^3\times3^4$

$=(2\times2\times2)\times(3\times3\times3\times3)$

$=8\times(9\times9)$

$=8\times81$

$=648$

(ii) $(-3)^3\times(-5)^2$

$=(-3\times-3\times-3)\times(-5\times-5)$

$=-27\times25$

$=-675$

(iii) $(-12)^2\times(-3)^3$

$=(-12\times-12)\times(-3\times-3\times-3)$

$=144\times-27$

$=-3888$

(iv) $(-1)^{20}\times(-1)^{17}\times(-1)^{41}$

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

$=1$

(v) $(-3)^5\times(-2)^3$

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

$=(-27\times9)\times(-8)$

$=-243\times-8$

$=1944$

7. (i) To verify $(-2)^3\times(-2)^2=(-2)^5$

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

$=-8\times4$

$=-32$

RHS $=-2\times-2\times-2\times-2\times-2$

$=4\times4\times-2$

$=-32$

LHS = RHS

(ii) $(-3)^5\div(-3)^3=(-3)^2$

LHS $=\dfrac{(-3)^5}{(-3)^3}$

$=\dfrac{-3\times-3\times-3\times-3\times-3}{-3\times-3\times-3}$

$=-3\times-3$

$=9$

RHS $=(-3)^2$

$=-3\times-3$

$=9$

LHS = R HS

(iii) To verify $3^7\div3^4=3^3$

LHS

$=\dfrac{3^7}{3^4}$

$=\dfrac{3\times3\times3\times3\times3\times3\times3}{3\times3\times3\times3}$

$=27$

RHS $=3^3$

$=3\times3\times3$

LHS = RHS = 27

8. Squares of first ten natural numbers are

$1^2=1, 2^2=4, 3^2=9, 4^2=16, 5^2=25$

$6^2=36, 7^2=49, 8^2=64, 9^2=81,$

$10^2=100$

9. Cubes of first ten natural numbers are

$1^3=1, 2^3=8, 3^3=27, 4^3=64, 5^3=125$

$6^3=216, 7^3=343, 8^3=512, 9^3=729,$

$10^3=1000$

10. (i) True (ii) True (iii) True (iv) False.

MCQ

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

Mental Maths

1. Yes, every whole number is integer.
2. –2, –1, 0, 1, 2, 3, 4, 5, 6, 7
3. Smallest two digit negative integer is –99
4. 50 – 10 – 15 – 20 + 5 = 10
5. –5, –6, –7, –8, –9, –10, –11, –12, –13, –14
6. Integer.
7. –14, –13, –12, –11 and –10
8. (i) $-15 - 21 = -36$
   (ii) $|x-7|$ if $x = 6$
   $= |6-7| = |-1| = 1$
   (iii) $|-13 - 5| = |-18| = 18$

4 Playing with Numbers

Exercise 4.1

1. (i) $3 \times 1 = 3$; $3 \times 2 = 6$; $3 \times 3 = 9$; $3 \times 4 = 12$; $3 \times 5 = 15$
   ∴ Multiples are 3, 6, 9, 12 and 15.
   (ii) ∵ $7 \times 1 = 7$; $7 \times 2 = 14$; $7 \times 3 = 21$; $7 \times 4 = 28$; $7 \times 5 = 35$
   Multiples are 7, 14, 21, 28 and 35.
   (iii) ∵ $15 \times 1 = 15$; $15 \times 2 = 30$; $15 \times 3 = 45$; $15 \times 4 = 60$; $15 \times 5 = 75$
   ∴ Multiples are 15, 30, 45, 60 and 75.
   (iv) ∵ $26 \times 1 = 26$; $26 \times 2 = 52$; $26 \times 3 = 78$; $26 \times 4 = 104$; $26 \times 5 = 130$
   ∴ Multiples are 26, 52, 78, 104 and 130.
   (v) $47 \times 1 = 47$; $47 \times 2 = 94$; $47 \times 3 = 141$; $47 \times 4 = 188$; $47 \times 5 = 235$
   ∴ Multiples are 47, 94, 141, 188, 235.
   (vi) $78 \times 1 = 78$; $78 \times 2 = 156$; $78 \times 3 = 234$; $78 \times 4 = 312$; $78 \times 5 = 390$
   Multiples are 78, 156, 234, 312 and 390.
2. (i) 25
   ∵ $1 \times 25 = 25$
   $5 \times 5 = 25$
   ∴ factors of 25 = 1, 5, 25
   (ii) 36
   ∵ $1 \times 36 = 36, 2 \times 18 = 36, 3 \times 12 = 36,$
   $4 \times 9 = 36, 6 \times 6 = 36$
   ∴ factors of 36
   = 1, 2, 3, 4, 6, 9, 12, 18, and 36
   (iii) 40
   ∵ $1 \times 40 = 40, 2 \times 20 = 40,$
   $4 \times 10 = 40, 5 \times 8 = 40$
   ∴ factors of 40 = 1, 2, 4, 5, 10, 20, 40
   (iv) 56
   ∵ $1 \times 56 = 56, 2 \times 28 = 56,$
   $4 \times 14 = 56, 8 \times 7 = 56$
   ∴ factors of 56 = 1, 2, 4, 7, 8 and 14
   (v) 169
   ∵ $1 \times 169 = 169, 13 \times 13 = 169$
   ∴ factors of 169 = 1, 13, 169
   (vi) 225
   ∵ $1 \times 225 = 225, 3 \times 75 = 225,$
   $5 \times 45 = 225, 15 \times 15 = 225$
   ∴ factors of 225 = 1, 3, 5, 15, 45, 75, 225
3. (i) 2
   ∵ 2 has only factors as 1 and 2 therefore 2 is a prime number.
   (ii) 9
   9 has is not a prime number because it has more factor than 1 and itself.
   (iii) 17
   ∵ 17 has only factors as 1 and 17
   ∴ 17 is a prime number
   (iv) 27
   27 is not a prime number because it has more factors than 1 and itself.
   (v) 39
   39 is not a prime number because it has more factors than 1 and itself.
   (vi) 57
   57 is not a prime number because it has more factors than 1 and itself.
4. (i) Prime numbers between 1 and 20 are 2, 3, 5, 7, 11, 13, 17, 19.
   (ii) Prime numbers between 30 and 40 are 31, 37.

(iii) Prime numbers between 50 and 70 are 53, 59, 61, 67.

(iv) Prime numbers between 75 and 100 are 79, 83, 89, 97.

(v) Prime numbers between 120 and 130 is 127.

(vi) Prime numbers between 140 to 150 are 143, 147, 149.

5. (i) $12 = \underset{\text{(odd)}}{5} + \underset{\text{(odd)}}{7}$

$36 = \underset{\text{(odd)}}{7} + \underset{\text{(odd)}}{29}$

$42 = \underset{\text{(odd)}}{5} + \underset{\text{(odd)}}{37}$

$84 = \underset{\text{(odd)}}{17} + \underset{\text{(odd)}}{67}$

6. (i) $12 = \underset{\text{(Prime No.)}}{5} + \underset{\text{(Prime No.)}}{7}$

(ii) $49 = \underset{\text{(Prime No.)}}{3} + \underset{\text{(Prime No.)}}{5} + \underset{\text{(Prime No.)}}{41}$

(iii) $63 = \underset{\text{(Prime No.)}}{7} + \underset{\text{(Prime No.)}}{13} + \underset{\text{(Prime No.)}}{43}$

(iv) $144 = \underset{\text{(Prime No.)}}{71} + \underset{\text{(Prime No.)}}{73}$

7. (i) Smallest factor of 55 = 1

(ii) Largest factor of 55 = 55

(iii) ∵ $55 \times 6 = 330$

∴ 6th multiple of 55 = 330

8. (i) 24 may be written as $13 + 11$

(ii) 42 may be written as $19 + 23$

(iii) 72 may be written as $41 + 31$

(iv) 80 may be written as $43 + 37$

(v) 96 may be written as $53 + 43$

9. (i) False (ii) False (iii) True (iv) False (v) True (vi) False (vii) False.

10. (i) 9 (ii) 2

(iii) Twin prime (iv) Prime number

Exercise 4.2

1.

Number	divisible by		
	2	3	6
(i) 1556	Y	N	N
(ii) 23082	Y	Y	Y
(iii) 5221	N	Y	N
(iv) 34521	N	Y	N

2. (i) 4255 divisible by 5 because it has 5 at unit place.

(ii) 7240 divisible by 5 because it has 0 at unit place.

(iii) 9273 not divisible 5 because it not has 5 or 0 at unit place.

(iv) 52675 divisible by 5 because it has 5 at unit place.

(v) 82640 divisible by 5 because it has 0 at unit place.

(vi) 325651 not divisible by 5 because it not has 5 or 0 at unit place.

3. (i) 1338 is divisible by 2 because it has 8 at unit place.

∵ $1 + 3 + 3 + 8 = 15$

because sum of digit is divisible by 3 therefore 1338 is divisible by 3 also

∴ 1338 is divisible by 6 because it is divisible by both 2 and 3.

(ii) 5243 is not divisible by 2 because it not has even number at unit place

∴ 5243 is not divisible by 6.

(iii) 2712 is divisible by 2 because it has even number at unit place.

$2 + 7 + 1 + 2 = 12$ because the sum of digits of 2712 is divisible by 3.

∴ 2712 is divisible by 3.

∴ 2712 is divisible by 6 because it is divisible by both 2 and 3.

(iv) 15252 is divisible by 2 because it has even number at unit place

∵ $1 + 5 + 2 + 5 + 2 = 15$

∵ sum of digits of 15252 is divisible by 3 therefore 15252 is divisible by 3.

∴ 15252 is divisible by 6 because it is divisible by both 2 and 3.

(v) ∵ 45875 not has even number at unit place

∴ It is not divisible by 2 and therefore not divisible by 6 also

(vi) 25512 is divisible by 2 because it has even number at unit place

∵ $2 + 5 + 5 + 1 + 2 = 15$

∵ sum of digits of 25512 is divisible by 3 therefore 25512 is divisible by 3.

$\therefore$ 25512 is divisible by 6 because it is divisible by both 2 and 3.

4. (i) 188 $\because$ last two digits is divisible by 4 therefore 188 is divisible by 4

$\because$ Last three digit is not divisible by 8 therefore 188 is not divisible by 8

$\therefore$ 188 is divisible by 4 but not divisible by 8.

(ii) 276, because last two digits (76) is divisible by 4 therefore 276 is divisible by 4.

$\because$ Last three digits (276) is not divisible by 8 therefore 276 is divisible by 8.

$\therefore$ 276 is divisible by 4 but not 8.

(iii) 508 $\because$ Last two digits (08) is divisible by 4 therefore 508 is divisible by 4.

$\because$ Last three digits (508) is not divisible by 8 therefore 508 is not divisible by 8.

$\therefore$ 508 is divisible by 4 but not divisible by 8.

(iv) 1548 $\because$ Last two digits (48) is divisible by 4 therefore 1548 is divisible by 4.

$\because$ Last three digits (548) is not divisible by 8 therefore 1548 is not divisible by 8.

$\therefore$ 1548 is divisible by 4 but not divisible by 8.

5. (i) 67452

sum of digit at odd places

$= 6 + 4 + 2 = 12$

sum of digits at even places

$= 7 + 5 = 12$

differences $12 - 12 = 0$

$\therefore$ difference of sum of digits at odd places and sum of digits at even places is zero (i.e. divisible by 11)

$\therefore$ 67452 is divisible by 11.

(ii) 500005

sum of digits at odd places

$= 5 + 0 + 0 = 5$

sum of digits at even places

$= 0 + 0 + 5 = 5$

difference $5 - 5 = 0$

$\because$ difference of sum of digits at odd places and sum of digits of even places is zero (i.e. divisible by 11)

$\therefore$ 500005 is divisible by 11.

(iii) 3883935

sum of digits at odd places

$= 3 + 8 + 9 + 5 = 25$

sum of digits at even places

$= 8 + 3 + 3 = 14$

difference $25 - 14 = 11$

$\because$ difference of sum of digits at odd places and sum of digits at even places is 11 (i.e., divisible by 11)

$\therefore$ 3883835 is divisible by 11.

(iv) 694521

sum of digits at odd places

$= 6 + 4 + 2 = 12$

sum of digits at even places

$= 9 + 5 + 1 = 15$

difference $= 15 - 12 = 3$

$\because$ difference of sum of digits at odd places and sum of digits of even places is 3 (i.e. not divisible by 11)

$\therefore$ 694521 is not divisible by 11.

6. (i) 156**0**9 is divisible by 3.

(ii) 470**0** is divisible by 4.

(iii) 5000**0** is divisible by 8.

(iv) 815**1**3 is divisible by 9.

(v) 6136**0** is divisible by 5.

(vi) 783**1**5 is divisible by 3.

7. (i) 857

We can write 857 as

$57 + 2(8) = 57 + 16 = 73$

$\because$ 73 is not divisible by 7 therefore 857 is not divisible by 7.

(ii) 2191

We can write 2191 as

$91 + 2 \times 21 = 91 + 42 = 133$

$\because$ 133 is divisible by 7

2191 is divisible by 7.

(iii) 294

We can write 294 as $94 + 2 \times 2 = 98$

$\because$ 98 is divisible by 7 therefore 294 is divisible by 7.

(iv) 3185

3185 can be written as

$85 + 2 \times 31 = 85 + 62 = 147$

$\because$ 147 is divisible by 7 therefore 3185 is divisible by 7.

8. (i) 147 **0** by 2
(ii) 163 **2** by 3
(iii) 237 **6** by 9
(iv) 81526 **0** by 4
(v) 86 **3** 72 by 11
(vi) 631 **0** 24 by 8
(vii) 158 **0** 0 by 10
(viii) 16795 **0** by 5
(ix) 76 **2** 718 by 11

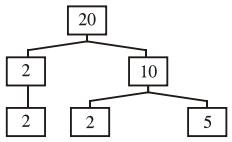
9. (i) True (ii) False (iii) False (iv) True
(v) True

10.

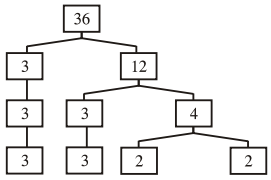
	2	3	4	5	6	7	8	9	10	11
(i) 248	Yes	No	Yes	No	No	No	Yes	Yes	No	No
(ii) 996	Yes	Yes	Yes	No	Yes	No	No	No	No	No
(iii) 1998	Yes	Yes	No	No	Yes	No	Yes	Yes	No	No
(iv) 2051	No	No	No	No	No	Yes	No	No	No	No
(v) 429714	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes
(vi) 406839	No	Yes	No	No	No	No	No	No	No	No
(vii) 92444	Yes	No	Yes	No	No	No	No	No	No	Yes
(viii) 2755	No	No	No	Yes	No	No	No	No	No	No
(ix) 10986	Yes	Yes	No	No	Yes	No	No	No	No	No
(x) 27756	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No

Exercise 4.3

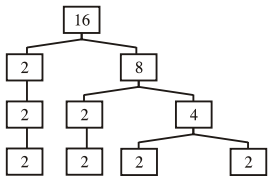
1. (i)



(ii)



(iii)



2. (i)

2	42
3	21
7	7
	1

$\therefore\ 42 = 2 \times 3 \times 7$

(ii)

2	96
2	48
2	24
2	12
2	6
3	3
	1

$\therefore\ 96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$

(iii)

2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

$\therefore\ 256 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

(iv)

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

$\therefore\ 288 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$

(v)

2	2520
2	1260
2	630
3	315
3	105
5	35
7	7
	1

$\therefore\ 2520 = 2\times 2\times 2\times 3\times 3\times 5\times 7$

(vi)

3	4335
5	1445
17	289
17	17
	1

$\therefore\ 4335 = 3\times 5\times 17\times 17$

3. Largest 3-digit number = 999

3	999
3	333
3	111
37	37
	1

$\therefore\ 999 = 3\times 3\times 3\times 27$

4. Smallest 5-digit number = 10000

2	10000
2	5000
2	2500
2	1250
5	625
5	125
5	25
5	5
	1

$\therefore\ 10000 = 2\times 2\times 2\times 2\times 5\times 5\times 5\times 5$

5. (i) $28 = 2 \times 2 \times 7$

Here all the three numbers

i.e., 2, 2 and 7 are prime numbers.

$\therefore$ It is a complete prime factorisation.

(ii) $48 = 2 \times 3 \times 8$

Prime numbers of 48 are 2, 3, 2, 2, 2.

Here the numbers given are 2, 3 and 8.

So, $48 = 2 \times 3 \times 8$ is not a complete prime factorisation.

(iii) $108 = 2 \times 2 \times 27$

Prime numbers of 108 are 2, 2, 3, 3 3.

Here 27, 18 given, which is not a prime numbers.

So, $108 = 2 \times 2 \times 27$ is not a complete prime factorisation.

Exercise 4.4

1. Largest 3-digit number = 999

3	999
3	333
3	111
37	37
	1

$\therefore$ Prime factors of $999 = 3\times 3\times 3\times 37$

2. (i) $12 = \boxed{2} \times \boxed{2} \times 3$

$24 = \boxed{2} \times \boxed{2} \times 2 \times 3$

$40 = \boxed{2} \times \boxed{2} \times 2 \times 5$

HCF = $2 \times 2 = 4$

(ii) Prime factors of

$15 = 3 \times (5)$

$35 = (5) \times 7$

$50 = 2 \times (5) \times 5$

HCF of 15, 35 and 50 = 5.

(iii) Prime factors of

$175 = \boxed{5 \times 5} \times 7$

$225 = 3 \times 3 \times \boxed{5 \times 5}$

HCF = $5 \times 5 = 25$

(iv) Prime factors of

$84 = \boxed{2} \times 2 \times (3) \times 7$

$120 = \boxed{2} \times 2 \times 2 \times (3) \times 5$

$138 = \boxed{2} \times (3) = 6$

HCF of 84, 120, 138 is $2 \times 3 = 6$

(v) Prime factors of

$72 = (2) \times 2 \times 2 \times (3) \times (3)$

$90 = (2) \times (3) \times (3) \times 5$

HCF of 72 and 90 = $2 \times 3 \times 3 = 18$

3. HCF of 235, 1075

```
235) 1075 (4
     940
     ---
     135) 235 (1
          135
          ---
          100) 135 (1
               100
               ---
               35) 100 (2
                   70
                   --
                   30) 35 (1
                       30
                       --
                       5) 30 (6
                          30
                          --
                          ×
```

∴ HCF of 235 and 1075 is 5.

(ii)

```
864) 936 (1
   – 864
   -----
   72) 864 (12
       72
       --
       144
       144
       ---
       ×
```

∴ HCF of 864 and 936 = 72.

(iii)

```
1162) 2241 (1
      1162
      ----
      1079) 1162 (1
            1079
            ----
            83) 1079 (13
                83
                --
                249
                249
                ---
                ×
```

∴ HCF of 1162 and 2241 = 83.

(iv) 391, 425, 521

First find HCF of 391, 425

```
∴ 391) 425 (1
       391
       ---
       134) 134 (1
            268
            ---
            123) 134 (1
                 123
                 ---
                 11) 123 (11
                     11
                     --
                     13
                     11
                     --
                     2) 11 (5
                        10
                        --
                        1 ) 2 ( 2
                            2
                            --
                            ×
```

∴ HCF of 391 and 425 is 1.

Now find HCF of 1 and 521.

```
1) 521 (521
   521
   ---
   ×
```

∴ HCF of 391, 425 and 521 = 1

(v) 180, 252, 324

First find HCF of 180 and 252.

```
∴ 180) 252 (1
       180
       ---
       72) 180 (2
           144
           ---
           36) 72 (2
               72
               --
               ×
```

∴ HCf of 180, 252 = 36

Now HCF of 36 and 324

$$36\overline{)324}\,(9$$
$$\underline{324}$$
$$\times$$

$\therefore$ HCF of 180, 252 and 324 = 36

4. (i) 13860

2	13860
2	6930
3	3465
3	1155
5	385
7	77
	11

$\therefore\ 13860 = 2^2 \times 3^2 \times 5 \times 7 \times 11$

(ii) 27830

2	27830
5	13915
11	2783
11	253
	23

$\therefore\ 27830 = 2 \times 5 \times 11 \times 11 \times 23$

$= 2 \times 5 \times 11^2 \times 23$

(iii)

2	21952
2	10976
2	5488
2	2744
2	1372
2	686
7	343
7	49
7	7
	1

$\therefore\ 21952 = 2^6 \times 7^3$

5. (i) $\frac{105}{230}$ HCF of 105 and 230

$$105\overline{)230}\,(2$$
$$\underline{210}$$
$$20\overline{)105}\,(5$$
$$\underline{100}$$
$$5\overline{)20}\,(4$$
$$\underline{20}$$
$$\times$$

$\therefore$ HCF of 105 and 230 = 5

$\therefore\ \frac{105 \div 5}{230 \div 5} = \frac{21}{46}$

(ii) First find HCF of 84, 144

$\therefore$ $84\overline{)144}\,(1$

$$\underline{84}$$
$$60\overline{)84}\,(1$$
$$\underline{60}$$
$$24\overline{)60}\,(2$$
$$\underline{48}$$
$$12\overline{)24}\,(2$$
$$\underline{-24}$$
$$\times$$

HCF = 12

$\therefore\ \frac{84}{144} = \frac{84 \div 12}{144 \div 12} = \frac{7}{12}$

(iii) First find HCF of 300, 375

$\therefore$ $300\overline{)375}\,(1$

$$\underline{300}$$
$$75\overline{)300}\,(4$$
$$\underline{300}$$
$$\times$$

$\therefore$ HCF of 300 and 375 = 75

$\therefore\ \frac{300}{375} = \frac{300 \div 75}{375 \div 75} = \frac{4}{5}$

(iv) First find HCF of 128 and 280

$\therefore$ $128\overline{)280}\,(2$

$$\underline{256}$$
$$24\overline{)128}\,(5$$
$$\underline{120}$$
$$8\overline{)24}\,(3$$
$$\underline{-24}$$
$$\times$$

$\therefore$ HCF of 128 and 280 = 8

$\therefore\ \frac{128}{280} = \frac{128 \div 8}{280 \div 8} = \frac{16}{35}$