CLASS: 6TH

SUBJECT: MATHEMATICS

ASSIGNMENT: FORMATIVE ASSESSMENT-I

Session: 2024-2025

CHAPTER 1

KNOWING OUR NUMBERS

Exercise 1.1

1. Fill in the blanks:

(a) 1 lakh =.....ten thousand.

(b) 1 million =..... hundred thousand.

(c) 1 crore =.....ten lakhs.

(d) 1 crore = ...million.

(e) 1 million =..... lakhs.

Solutions:

(a) 1 lakh = 10 ten thousand

= 1,00,000

(b) 1 million = 10 hundred thousand

= 10,00,000

(c) 1 crore = 10 ten lakhs

= 1,00,00,000

(d) 1 crore = 10 million

= 1,00,00,000

(e) 1 million = 10 lakhs

= 1,000,000

2. Place commas correctly and write the numerals:

(a) Seventy three lakh seventy five thousand three hundred seven

(b) Nine crore five lakh forty one

(c) Seven crore fifty two lakh twenty one thousand three hundred two

(d) Fifty eight million four hundred twenty three thousand two hundred two

(e) Twenty three lakh thirty thousand ten

Solutions:

(a) The numeral of seventy three lakh seventy five thousand three hundred seven is 73,75,307

(b) The numeral of nine crore five lakh forty one is 9,05,00,041

(c) The numeral of seven crore fifty two lakh twenty one thousand three hundred two is 7,52,21,302

(d) The numeral of fifty eight million four hundred twenty three thousand two hundred two is 5,84,23,202

(e) The numeral of twenty three lakh thirty thousand ten is 23,30,010

3. Insert commas suitably and write the names according to the Indian System of Numeration:

(a) 87595762 (b) 8546283 (c) 99900046 (d) 98432701

Solutions:

(a) 8,75,95,762 – Eight crore seventy five lakh ninety five thousand seven hundred sixty two

(b) 85,46,283 – Eighty five lakh forty six thousand two hundred eighty three

(c) 9,99,00,046 – Nine crore ninety nine lakh forty six

(d) 9,84,32,701 – Nine crore eighty four lakh thirty two thousand seven hundred one

4. Insert commas suitably and write the names according to the International System of Numeration:

(a) 78921092 (b) 7452283 (c) 99985102 (d) 48049831

Solutions:

(a) 78,921,092 – Seventy eight million nine hundred twenty one thousand ninety two

(b) 7,452,283 – Seven million four hundred fifty-two thousand two hundred eighty three

(c) 99,985,102 – Ninety-nine million nine hundred eighty five thousand one hundred two

(d) 48,049,831 – Forty-eight million forty-nine thousand eight hundred thirty-one

× 2825 = 87575

Exercise 1.2

1. A book exhibition was held for four days in a school. The number of tickets sold at the counter on the first, second, third and final day was respectively 1094, 1812, 2050 and 2751. Find the total number of tickets sold on all four days.

Solutions:

Number of tickets sold on 1st day = 1094

Number of tickets sold on 2nd day = 1812

Number of tickets sold on 3rd day = 2050

Number of tickets sold on 4th day = 2751

Hence, the total number of tickets sold on all four days = 1094 + 1812 + 2050 + 2751 = 7707 tickets

2. Shekhar is a famous cricket player. He has so far scored 6980 runs in test matches. He wishes to complete 10,000 runs. How many more runs does he need?

Solutions:

Shekhar scored = 6980 runs

He wants to complete = 10000 runs

Runs needed to score more = 10000 – 6980 = 3020

Hence, he needs 3020 more runs to score

3. In an election, the successful candidate registered 5,77,500 votes, and his nearest rival secured 3,48,700 votes. By what margin did the successful candidate win the election?

Solutions:

No. of votes secured by the successful candidate = 577500

No. of votes secured by his rival = 348700

Margin by which he won the election = 577500 – 348700 = 228800 votes

∴ The successful candidate won the election by 228800 votes

4. Kirti bookstore sold books worth Rs 2,85,891 in the first week of June and books worth Rs 4,00,768 in the second week of the month. How much was the sale for the two weeks together? In which week was the sale greater and by how much?

Solutions:

Price of books sold in the first week of June = Rs 285891

Price of books sold in the second week of June = Rs 400768

No. of books sold in both weeks together = Rs 285891 + Rs 400768 = Rs 686659

The sale of books is the highest in the second week.

Difference in the sale in both weeks = Rs 400768 – Rs 285891 = Rs 114877

∴ Sale in the second week was greater by Rs 114877 than in the first week.

8. A student multiplied 7236 by 65 instead of multiplying by 56. By how much was his answer greater than the correct answer?

Solutions:

Difference between 65 and 56, i.e. (65 – 56) = 9

The difference between the correct and incorrect answer = 7236 × 9 = 65124

Hence, by 65124, the answer was greater than the correct answer.

10. Medicine is packed in boxes, each weighing 4 kg 500g. How many such boxes can be loaded in a van which cannot carry beyond 800 kg?

Solutions:

Weight of one box = 4 kg 500 g = 4 × 1000 + 500

= 4500 g

Maximum weight carried by the van = 800 kg = 800 × 1000

= 800000 g

Hence, the number of boxes that can be loaded in the van = 800000/4500 = 177 boxes

12. A vessel has 4 litres and 500 ml of curd. In how many glasses, each of 25 ml capacity, can it be filled?

Solutions:

Quantity of curd in the vessel = 4 l 500 ml = 4 × 1000 + 500 = 4500 ml

Capacity of 1 glass = 25 ml

∴ Number of glasses that can be filled with curd = 4500 / 25 = 180 glasses

Hence, 180 glasses can be filled with curd.

Exercise 1.3

1. Estimate each of the following using the general rule:

(a) 730 + 998 (b) 796 – 314 (c) 12904 + 2888 (d) 28292 – 21496

Make ten more such examples of addition, subtraction and estimation of their outcome.

Solutions:

(a) 730 + 998

Round off to hundreds

730 rounds off to 700

998 rounds off to 1000

Hence, 730 + 998 = 700 + 1000 = 1700

(b) 796 – 314

Round off to hundreds

796 rounds off to 800

314 rounds off to 300

Hence, 796 – 314 = 800 – 300 = 500

(c) 12904 + 2888

Round off to thousands

12904 rounds off to 13000

2888 rounds off to 3000

Hence, 12904 + 2888 = 13000 + 3000 = 16000

(d) 28292 – 21496

Round off to thousands

28292 round off to 28000

21496 round off to 21000

Hence, 28292 – 21496 = 28000 – 21000 = 7000

Ten more such examples are

(i) 330 + 280 = 300 + 300 = 600

(ii) 3937 + 5990 = 4000 + 6000 = 10000

(iii) 6392 – 3772 = 6000 – 4000 = 2000

(iv) 5440 – 2972 = 5000 – 3000 = 2000

(v) 2175 + 1206 = 2000 + 1000 = 3000

(vi) 1110 – 1292 = 1000 – 1000 = 0

(vii) 910 + 575 = 900 + 600 = 1500

(viii) 6400 – 4900 = 6000 – 5000 = 1000

(ix) 3731 + 1300 = 4000 + 1000 = 5000

(x) 6485 – 4319 = 6000 – 4000 = 2000

2. Give a rough estimate (by rounding off to the nearest hundreds) and also a closer estimate (by rounding off to the nearest tens):

(a) 439 + 334 + 4317 (b) 108734 – 47599 (c) 8325 – 491 (d) 489348 – 48365

Make four more such examples.

Solutions:

(a) 439 + 334 + 4317

Rounding off to the nearest hundreds

439 + 334 + 4317 = 400 + 300 + 4300

= 5000

Rounding off to the nearest tens

439 + 334 + 4317 = 440 + 330 + 4320

= 5090

(b) 108734 – 47599

Rounding off to the nearest hundreds

108734 – 47599 = 108700 – 47600

= 61100

Rounding off to the nearest tens

108734 – 47599 = 108730 – 47600

= 61130

(c) 8325 – 491

Rounding off to the nearest hundreds

8325 – 491 = 8300 – 500

= 7800

Rounding off to the nearest tens

8325 – 491 = 8330 – 490

= 7840

(d) 489348 – 48365

Rounding off to the nearest hundreds

489348 – 48365 = 489300 – 48400

= 440900

Rounding off to the nearest tens

489348 – 48365 = 489350 – 48370

= 440980

Four more examples are as follows:

(i) 4853 + 662

Rounding off to the nearest hundreds

4853 + 662 = 4800 + 700

= 5500

Rounding off to the nearest tens

4853 + 662 = 4850 + 660

= 5510

(ii) 775 – 390

Rounding off to the nearest hundreds

775 – 390 = 800 – 400

= 400

Rounding off to the nearest tens

775 – 390 = 780 – 400

= 380

(iii) 6375 – 2875

Rounding off to the nearest hundreds

6375 – 2875 = 6400 – 2900

= 3500

Rounding off to the nearest tens

6375 – 2875 = 6380 – 2880

= 3500

(iv) 8246 – 6312

Rounding off to the nearest hundreds

8246 – 6312 = 8200 – 6300

= 1900

Rounding off to the nearest tens

8246 – 6312 = 8240 – 6310

= 1930

3. Estimate the following products using the general rule:

(a) 578 × 161

(b) 5281 × 3491

(c) 1291 × 592

(d) 9250 × 29

Make four more such examples.

Solutions:

(a) 578 × 161

Rounding off by general rule

578 and 161 rounded off to 600 and 200, respectively

600

× 200

_____

120000

_____

(b) 5281 × 3491

Rounding off by general rule

5281 and 3491 rounded off to 5000 and 3500, respectively

5000

× 3500

_____

17500000

_____

(c) 1291 × 592

Rounding off by general rule

1291 and 592 rounded off to 1300 and 600, respectively

1300

× 600

_____

780000

_____

(d) 9250 × 29

Rounding off by general rule

9250 and 29 rounded off to 9000 and 30, respectively

9000

× 30

_____

270000

Chapter 2:
Whole Numbers

Exercise 2.1

1. Write the next three natural numbers after 10999.

Solutions:

The next three natural numbers after 10999 are 11000, 11001 and 11002.

2. Write the three whole numbers occurring just before 10001.

Solutions:

The three whole numbers occurring just before 10001 are 10000, 9999 and 9998.

3. Which is the smallest whole number?

Solutions: The smallest whole number is 0.

4. How many whole numbers are there between 32 and 53?

Solutions:

The whole numbers between 32 and 53 are as follows:

(33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52)

Hence, there are 20 whole numbers between 32 and 53

5. Write the successor of:

(a) 2440701 (b) 100199 (c) 1099999 (d) 2345670

Solutions:

The successors are

(a) 2440701 + 1 = 2440702

(b) 100199 + 1 = 100200

(c) 1099999 + 1 = 1100000

(d) 2345670 + 1 = 2345671

6. Write the predecessor of:

(a) 94 (b) 10000 (c) 208090 (d) 7654321

Solutions:

The predecessors are

(a) 94 – 1 = 93

(b) 10000 – 1 = 9999

(c) 208090 – 1 = 208089

7. In each of the following pairs of numbers, state which whole number is on the left of the other number on the number line. Also, write them with the appropriate sign (>, <) between them.

(a) 530, 503 (b) 370, 307 (c) 98765, 56789 (d) 9830415, 10023001

Solutions:

(a) 530 > 503

Hence, 503 is on the left side of 530 on the number line.

(b) 370 > 307

Hence, 307 is on the left side of 370 on the number line.

(c) 98765 > 56789

Hence, 56789 is on the left side of 98765 on the number line.

(d) 9830415 < 10023001

Hence, 9830415 is on the left side of 10023001 on the number line

8. Which of the following statements are true (T) and which are false (F)?

(a) Zero is the smallest natural number.

Solution:

False

0 is not a natural number.

(b) 400 is the predecessor of 399.

Solution:

False

The predecessor of 399 is 398 because (399 – 1 = 398)

(c) Zero is the smallest whole number.

Solution:

True

Zero is the smallest whole number.

(d) 600 is the successor of 599.

Solution:

True

Since (599 + 1 = 600)

(e) All natural numbers are whole numbers.

Solution:

True

All natural numbers are whole numbers.

(f) All whole numbers are natural numbers.

Solution:

False

0 is a whole number but is not a natural number.

(g) The predecessor of a two-digit number is never a single-digit number.

Solution:

False

For example, the predecessor of 10 is 9.

(h) 1 is the smallest whole number.

Solution:

False

0 is the smallest whole number.

(i) The natural number 1 has no predecessor.

True

The predecessor of 1 is 0, but it is not a natural number.

(j) The whole number 1 has no predecessor.

Solution:

False

0 is the predecessor of 1 and is a whole number.

(k) The whole number 13 lies between 11 and 12.

Solution:

False

13 does not lie between 11 and 12.

(l) The whole number 0 has no predecessor.

Solution:

True

The predecessor of 0 is -1 and is not a whole number.

(m) The successor of a two-digit number is always a two-digit number.

Solution:

False

For example, the successor of 99 is 100

Exercise 2.2

1. Find the sum by suitable rearrangement:

(a) 837 + 208 + 363

(b) 1962 + 453 + 1538 + 647

Solutions:

(a) Given 837 + 208 + 363

= (837 + 363) + 208

= 1200 + 208

= 1408

(b) Given 1962 + 453 + 1538 + 647

= (1962 + 1538) + (453 + 647)

= 3500 + 1100

= 4600

2. Find the product by suitable rearrangement:

(a) 2 × 1768 × 50

(b) 4 × 166 × 25

(c) 8 × 291 × 125

(d) 625 × 279 × 16

(e) 285 × 5 × 60

(f) 125 × 40 × 8 × 25

Solutions:

(a) Given 2 **×** 1768 **×** 50

= 2 × 50 × 1768

= 100 × 1768

= 176800

(b) Given 4 × 166 × 25

= 4 × 25 × 166

= 100 × 166

= 16600

(c) Given 8 × 291 × 125

= 8 × 125 × 291

= 1000 × 291

= 291000

(d) Given 625 × 279 × 16

= 625 × 16 × 279

= 10000 × 279

= 2790000

3. Find the value of the following:

(a) 297 × 17 + 297 × 3

(b) 54279 × 92 + 8 × 54279

(c) 81265 × 169 – 81265 × 69

(d) 3845 × 5 × 782 + 769 × 25 × 218

Solutions:

(a) Given 297 × 17 + 297 × 3

= 297 × (17 + 3)

= 297 × 20

= 5940

(b) Given 54279 × 92 + 8 × 54279

= 54279 × 92 + 54279 × 8

= 54279 × (92 + 8)

= 54279 × 100

= 5427900

(c) Given 81265 × 169 – 81265 × 69

= 81265 × (169 – 69)

= 81265 × 100

= 8126500

(d) Given 3845 × 5 × 782 + 769 × 25 × 218

= 3845 × 5 × 782 + 769 × 5 × 5 × 218

= 3845 × 5 × 782 + 3845 × 5 × 218

= 3845 × 5 × (782 + 218)

= 19225 × 1000

= 19225000

4. Find the product using suitable properties.

(a) 738 × 103

(b) 854 × 102

(c) 258 × 1008

(d) 1005 × 168

Solutions:

(a) Given 738 × 103

= 738 × (100 + 3)

= 738 × 100 + 738 × 3 (using distributive property)

= 73800 + 2214

= 76014

(b) Given 854 × 102

= 854 × (100 + 2)

= 854 × 100 + 854 × 2 (using distributive property)

= 85400 + 1708

= 87108

(c) Given 258 × 1008

= 258 × (1000 + 8)

= 258 × 1000 + 258 × 8 (using distributive property)

= 258000 + 2064

= 260064

(d) Given 1005 × 168

= (1000 + 5) × 168

= 1000 × 168 + 5 × 168 (using distributive property)

= 168000 + 840

= 168840

5. A taxi driver filled his car petrol tank with 40 litres of petrol on Monday. The next day, he filled the tank with 50 litres of petrol. If the petrol costs ₹ 44 per litre, how much did he spend in all on petrol?

Solutions:

Petrol quantity filled on Monday = 40 litres

Petrol quantity filled on Tuesday = 50 litres

Total petrol quantity filled = (40 + 50) litre

Cost of petrol per litre = ₹ 44

Total money spent = 44 × (40 + 50)

= 44 × 90

= ₹ 3960

6. A vendor supplies 32 litres of milk to a hotel in the morning and 68 litres of milk in the evening. If the milk costs ₹ 15 per litre, how much money is due to the vendor per day?

Solutions:

Milk quantity supplied in the morning = 32 litres

Milk quantity supplied in the evening = 68 litres

Cost of milk per litre = ₹ 15

Total cost of milk per day = 15 × (32 + 68)

= 15 × 100

= ₹ 1500

Hence, the money due to the vendor per day is ₹ 1500

7. Match the following:

(i) 425 × 136 = 425 × (6 + 30 + 100) (a) Commutativity under multiplication.

(ii) 2 × 49 × 50 = 2 × 50 × 49 (b) Commutativity under addition.

(iii) 80 + 2005 + 20 = 80 + 20 + 2005 (c) Distributivity of multiplication over addition.

Solutions:

(i) 425 × 136 = 425 × (6 + 30 + 100) (c) Distributivity of multiplication over addition**.**

Hence (c) is the correct answer

(ii) 2 × 49 × 50 = 2 × 50 × 49 (a) Commutativity under multiplication

Hence, (a) is the correct answer

(iii) 80 + 2005 + 20 = 80 + 20 + 2005 (b) Commutativity under addition

Hence, (b) is the correct answer

Exercise 2.3

1. Which of the following will not represent zero?

(a) 1 + 0

(b) 0 × 0

(c) 0 / 2

(d) (10 – 10) / 2

Solutions:

(a) 1 + 0 = 1

Hence, it does not represent zero.

(b) 0 × 0 = 0

Hence, it represents zero.

(c) 0 / 2 = 0

Hence, it represents zero.

(d) (10 – 10) / 2 = 0 / 2 = 0

Hence, it represents zero.

2. If the product of two whole numbers is zero, can we say that one or both of them will be zero? Justify through examples.

Solutions:

If the product of two whole numbers is zero, definitely one of them is zero

Example: 0 × 3 = 0 and 15 × 0 = 0

If the product of two whole numbers is zero, both of them may be zero

Example: 0 × 0 = 0

Yes, if the product of two whole numbers is zero, then both of them will be zero.

3. If the product of two whole numbers is 1, can we say that one or both of them will be 1? Justify through examples.

Solutions:

If the product of two whole numbers is 1, both numbers should be equal to 1

Example: 1 × 1 = 1

But 1 × 5 = 5

Hence, it's clear that the product of two whole numbers will be 1, only in situations when both numbers to be multiplied are 1.

4. Find using distributive property:

(a) 728 × 101

(b) 5437 × 1001

(c) 824 × 25

(d) 4275 × 125

(e) 504 × 35

Solutions:

(a) Given 728 × 101

= 728 × (100 + 1)

= 728 × 100 + 728 × 1

= 72800 + 728

= 73528

(b) Given 5437 × 1001

= 5437 × (1000 + 1)

= 5437 × 1000 + 5437 × 1

= 5437000 + 5437

= 5442437

5. Study the pattern:

1 × 8 + 1 = 9

1234 × 8 + 4 = 9876

12 × 8 + 2 = 98

12345 × 8 + 5 = 98765

123 × 8 + 3 = 987

Write the next two steps. Can you say how the pattern works?

(Hint: 12345 = 11111 + 1111 + 111 + 11 + 1)

Solutions:

123456 × 8 + 6 = 987654

1234567 × 8 + 7 = 9876543

Given 123456 = (111111 + 11111 + 1111 + 111 + 11 + 1)

123456 × 8 = (111111 + 11111 + 1111 + 111 + 11 + 1) × 8

= 111111 × 8 + 11111 × 8 + 1111 × 8 + 111 × 8 + 11 × 8 + 1 × 8

= 888888 + 88888 + 8888 + 888 + 88 + 8

= 987648

123456 × 8 + 6 = 987648 + 6

= 987654

Yes, here the pattern works

1234567 × 8 + 7 = 9876543

Given 1234567 = (1111111 + 111111 + 11111 + 1111 + 111 + 11 + 1)

1234567 × 8 = (1111111 + 111111 + 11111 + 1111 + 111 + 11 + 1) × 8

= 1111111 × 8 + 111111 × 8 + 11111 × 8 + 1111 × 8 + 111 × 8 + 11 × 8 + 1 × 8

= 8888888 + 888888 + 88888 + 8888 + 888 + 88 + 8

= 9876536

1234567 × 8 + 7 = 9876536 + 7

= 9876543

Yes, here the pattern works.

CHAPTER 3

PLAYING WITH NUMBERS

Exercise 3.1

1. Write all the factors of the following numbers:

(a) 24

(b) 15

(c) 21

(d) 27

(e) 12

(f) 20

(g) 18

(h) 23

(i) 36

Solutions:

(a) 24

24 = 1 × 24

24 = 2 × 12

24 = 3 × 8

24 = 4 × 6

24 = 6 × 4

Stop here since 4 and 6 have occurred earlier

Hence, the factors of 24 are 1, 2, 3, 4, 6, 8, 12 and 24

4

(b) 15

15 = 1 × 15

15 = 3 × 5

15 = 5 × 3

Stop here since 3 and 5 have occurred earlier

Hence, the factors of 15 are 1, 3, 5 and 15

(c) 21

21 = 1 × 21

21 = 3 × 7

21 = 7 × 3

Stop here since 3 and 7 have occurred earlier

Hence, the factors of 21 are 1, 3, 7 and 21

2

(d) 27

27 = 1 × 27

27 = 3 × 9

27 = 9 × 3

Stop here since 3 and 9 have occurred earlier

Hence, the factors of 27 are 1, 3, 9 and 27

(e) 12

12 = 1 × 12

12 = 2 × 6

12 = 3 × 4

12 = 4 × 3

Stop here since 3 and 4 have occurred earlier

Hence, the factors of 12 are 1, 2, 3, 4, 6 and 12

(f) 20

20 = 1 × 20

20 = 2 × 10

20 = 4 × 5

20 = 5 × 4

Stop here since 4 and 5 have occurred earlier

Hence, the factors of 20 are 1, 2, 4, 5, 10 and 20

(g) 18

18 = 1 × 18

18 = 2 × 9

18 = 3 × 6

18 = 6 × 3

Stop here since 3 and 6 have occurred earlier

Hence, the factors of 18 are 1, 2, 3, 6, 9 and 18

(h) 23

23 = 1 × 23

23 = 23 × 1

Since 1 and 23 have occurred earlier

Hence, the factors of 23 are 1 and 23

(i) 36

36 = 1 × 36

36 = 2 × 18

36 = 3 × 12

36 = 4 × 9

36 = 6 × 6

Stop here since both the factors (6) are the same. Thus the factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18 and 36

3

2. Write the first five multiples of:

(a) 5

(b) 8

(c) 9

Solutions:

(a) The required multiples are:

5 × 1 = 5

5 × 2 = 10

5 × 3 = 15

5 × 4 = 20

5 × 5 = 25

Hence, the first five multiples of 5 are 5, 10, 15, 20 and 25

(b) The required multiples are:

8 × 1 = 8

8 × 2 = 16

8 × 3 = 24

8 × 4 = 32

8 × 5 = 40

Hence, the first five multiples of 8 are 8, 16, 24, 32 and 40

3. Match the items in column 1 with the items in column 2.

Column 1	**Column 2**
(i) 35	**(a) Multiple of 8**
(ii) 15	**(b) Multiple of 7**
(iii) 16	**(c) Multiple of 70**
(iv) 20	**(d) Factor of 30**
(v) 25	**(e) Factor of 50**
	(f) Factor of 20

Solutions:

(i) 35 is a multiple of 7

Hence, option (b)

(ii) 15 is a factor of 30

Hence, option (d)

(iii) 16 is a multiple of 8

Hence, option (a)

(iv) 20 is a factor of 20

Hence, option (f)

(v) 25 is a factor of 50

Hence, option (e)

4. Find all the multiples of 9 up to 100.

Solutions:

9 × 1 = 9

9 × 2 = 18

9 × 3 = 27

9 × 4 = 36

9 × 5 = 45

9 × 6 = 54

9 × 7 = 63

9 × 8 = 72

9 × 9 = 81

9 × 10 = 90

9 × 11 = 99

∴ All the multiples of 9 up to 100 are 9, 18, 27, 36, 45, 54, 63, 72, 81, 90 and 99

Exercise 3.3

1. Using divisibility tests, determine which of the following numbers are divisible by 2; by 3; by 4; by 5; by 6; by 8; by 9; by 10; by 11 (say, yes or no):

Numbers	Divisible by								
	2	3	4	5	6	8	9	10	11
128	Yes	No	Yes	No	No	Yes	No	No	No
990	.....	.....	.....	.....	.....	.....	.....	.....	.....
1586	.....	.....	.....	.....	.....	.....	.....	.....	.....
275	.....	.....	.....	.....	.....	.....	.....	.....	.....
6686	.....	.....	.....	.....	.....	.....	.....	.....	.....
639210	.....	.....	.....	.....	.....	.....	.....	.....	.....
429714	.....	.....	.....	.....	.....	.....	.....	.....	.....
2856	.....	.....	.....	.....	.....	.....	.....	.....	.....
3060	.....	.....	.....	.....	.....	.....	.....	.....	.....
406839	.....	.....	.....	.....	.....	.....	.....	.....	.....

Solutions:

Numbers	Divisible by								
	2	3	4	5	6	8	9	10	11
128	Yes	No	Yes	No	No	Yes	No	No	No
990	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
1586	Yes	No	No	No	No	No	No	No	No
275	No	No	No	Yes	No	No	No	No	Yes
6686	Yes	No	No	No	No	No	No	No	No
639210	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
429714	Yes	Yes	No	No	Yes	No	Yes	No	No
2856	Yes	Yes	Yes	No	Yes	Yes	No	No	No
3060	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
406839	No	Yes	No	No	No	No	No	No	No

2. Using divisibility tests, determine which of the following numbers are divisible by 4; by 8:

(a) 572

(b) 726352

(c) 5500

(d) 6000

(e) 12159

(f) 14560

(g) 21084

(h) 31795072

(i) 1700

(j) 2150

Solutions:

(a) 572

72 are the last two digits. Since 72 is divisible by 4. Hence, 572 is also divisible by 4

572 are the last three digits. Since 572 is not divisible by 8. Hence, 572 is not divisible by 8

(b) 726352

52 are the last two digits. Since 52 is divisible by 4. Hence, 726352 is divisible by 4

352 are the last three digits. Since 352 is divisible by 8. Hence, 726352 is divisible by 8

(c) 5500

Since the last two digits are 00. Hence 5500 is divisible by 4

500 are the last three digits. Since 500 is not divisible by 8. Hence, 5500 is not divisible by 8

(d) 6000

Since the last two digits are 00. Hence 6000 is divisible by 4

Since the last three digits are 000. Hence, 6000 is divisible by 8

(e) 12159

59 are the last two digits. Since 59 is not divisible by 4. Hence, 12159 is not divisible by 4

159 are the last three digits. Since 159 is not divisible by 8. Hence, 12159 is not divisible by 8

(f) 14560

60 are the last two digits. Since 60 is divisible by 4. Hence, 14560 is divisible by 4

560 are the last three digits. Since 560 is divisible by 8. Hence, 14560 is divisible by 8

(g) 21084

84 are the last two digits. Since 84 is divisible by 4. Hence, 21084 is divisible by 4

084 are the last three digits. Since 084 is not divisible by 8. Hence, 21084 is not divisible by 8

(h) 31795072

72 are the last two digits. Since 72 is divisible by 4. Hence, 31795072 is divisible by 4

072 are the last three digits. Since 072 is divisible by 8. Hence, 31795072 is divisible by 8

3. Using divisibility tests, determine which of the following numbers are divisible by 6:

(a) 297144

(b) 1258

(c) 4335

(d) 61233

(e) 901352

(f) 438750

(g) 1790184

(h) 12583

(i) 639210

(j) 17852

Solutions:

(a) 297144

Since the last digit of the number is 4. Hence, the number is divisible by 2

By adding all the digits of the number, we get 27, which is divisible by 3. Hence, the number is divisible by 3

∴ The number is divisible by both 2 and 3. Hence, the number is divisible by 6

(b) 1258

Since the last digit of the number is 8. Hence, the number is divisible by 2

By adding all the digits of the number, we get 16 which is not divisible by 3. Hence, the number is not divisible by 3

∴ The number is not divisible by both 2 and 3. Hence, the number is not divisible by 6

(c) 4335

Since the last digit of the number is 5, which is not divisible by 2. Hence, the number is not divisible by 2

By adding all the digits of the number, we get 15 which is divisible by 3. Hence, the number is divisible by 3

∴ The number is not divisible by both 2 and 3. Hence, the number is not divisible by 6

(d) 61233

Since the last digit of the number is 3, which is not divisible by 2. Hence, the number is not divisible by 2

By adding all the digits of the number, we get 15 which is divisible by 3. Hence, the number is divisible by 3

∴ The number is not divisible by both 2 and 3. Hence, the number is not divisible by 6

(e) 901352

Since the last digit of the number is 2. Hence, the number is divisible by 2

By adding all the digits of the number, we get 20 which is not divisible by 3. Hence, the number is not divisible by 3

∴ The number is not divisible by both 2 and 3. Hence, the number is not divisible by 6

(f) 438750

Since the last digit of the number is 0. Hence, the number is divisible by 2

By adding all the digits of the number, we get 27 which is divisible by 3. Hence, the number is divisible by 3

∴ The number is divisible by both 2 and 3. Hence, the number is divisible by 6

(g) 1790184

Since the last digit of the number is 4. Hence, the number is divisible by 2

By adding all the digits of the number, we get 30 which is divisible by 3. Hence, the number is divisible by 3

∴ The number is divisible by both 2 and 3. Hence, the number is divisible by 6

(h) 12583

Since the last digit of the number is 3. Hence, the number is not divisible by 2

By adding all the digits of the number, we get 19 which is not divisible by 3. Hence, the number is not divisible by 3

∴ The number is not divisible by both 2 and 3. Hence, the number is not divisible by 6

(i) 639210

Since the last digit of the number is 0. Hence, the number is divisible by 2

By adding all the digits of the number, we get 21, which is divisible by 3. Hence, the number is divisible by 3

∴ The number is divisible by both 2 and 3. Hence, the number is divisible by 6

(j) 17852

Since the last digit of the number is 2. Hence, the number is divisible by 2

By adding all the digits of the number, we get 23 which is not divisible by 3. Hence, the number is not divisible by 3

∴ The number is not divisible by both 2 and 3. Hence, the number is not divisible by 6

4. Using divisibility tests, determine which of the following numbers are divisible by 11:

(a) 5445

(b) 10824

(c) 7138965

(d) 70169308

(e) 10000001

(f) 901153

Solutions:

(a) 5445

Sum of the digits at odd places = 5 + 4

= 9

Sum of the digits at even places = 4 + 5

= 9

Difference = 9 – 9 = 0

Since the difference between the sum of digits at odd places and the sum of digits at even places is 0. Hence, 5445 is divisible by 11

(b) 10824

Sum of digits at odd places = 4 + 8 + 1

= 13

Sum of digits at even places = 2 + 0

= 2

Difference = 13 – 2 = 11

Since the difference between the sum of digits at odd places and the sum of digits at even places is 11, which is divisible by 11. Hence, 10824 is divisible by 11

(c) 7138965

Sum of digits at odd places = 5 + 9 + 3 + 7 = 24

Sum of digits at even places = 6 + 8 + 1 = 15

Difference = 24 – 15 = 9

Since the difference between the sum of digits at odd places and the sum of digits at even places is 9, which is not divisible by 11. Hence, 7138965 is not divisible by 11

(d) 70169308

Sum of digits at odd places = 8 + 3 + 6 + 0

= 17

Sum of digits at even places = 0 + 9 + 1 + 7

= 17

Difference = 17 – 17 = 0

Since the difference between the sum of digits at odd places and the sum of digits at even places is 0. Hence, 70169308 is divisible by 11

(e) 10000001

Sum of digits at odd places = 1

Sum of digits at even places = 1

Difference = 1 – 1 = 0

Since the difference between the sum of digits at odd places and the sum of digits at even places is 0. Hence, 10000001 is divisible by 11

(f) 901153

Sum of digits at odd places = 3 + 1 + 0

= 4

Sum of digits at even places = 5 + 1 + 9

= 15

Difference = 15 – 4 = 11

Since the difference between the sum of digits at odd places and the sum of digits at even places is 11, which is divisible by 11. Hence, 901153 is divisible by 11

5. Write the smallest digit and the greatest digit in the blank space of each of the following numbers so that the number formed is divisible by 3:

(a) __6724

(b) 4765__ 2

Solutions:

(a) __6724

The sum of the given digits = 19

The sum of its digit should be divisible by 3 to make the number divisible by 3

Since 21 is the smallest multiple of 3, which comes after 19

So, smallest number = 21 – 19

= 2

Now 2 + 3 + 3 = 8

But 2 + 3 + 3 + 3 = 11

Now, if we put 8, the sum of digits will be 27, which is divisible by 3

Therefore the number will be divisible by 3

Hence, the largest number is 8

(b) 4765__ 2

Sum of the given digits = 24

Sum of its digits should be divisible by 3 to make the number divisible by 3

Since, 24 is already divisible by 3. Hence, the smallest number that can be replaced is 0

Now, 0 + 3 = 3

3 + 3 = 6

3 + 3 + 3 = 9

3 + 3 + 3 + 3 = 12

If we put 9, the sum of its digits becomes 33. Since 33 is divisible by 3.

Therefore the number will be divisible by 3

Hence, the largest number is 9

6. Write a digit in the blank space of each of the following numbers so that the number formed is divisible by 11:

(a) 92__ 389

(b) 8 __9484

Solutions:

(a) 92__ 389

Let ‘a’ be placed here

Sum of its digits at odd places = 9 + 3 + 2

= 14

Sum of its digits at even places = 8 + a + 9

= 17 + a

Difference = 17 + a – 14

= 3 + a

The difference should be 0 or a multiple of 11, then the number is divisible by 11

If 3 + a = 0

a = -3

But it cannot be a negative

Taking the closest multiple of 11 which is near 3

It is 11 which is near 3

Now, 3 + a = 11

a = 11 – 3

a = 8

Therefore the required digit is 8

(b) 8 __9484

Let ‘a’ be placed here

Sum of its digits at odd places = 4 + 4 + a

= 8 + a

Sum of its digits at even places = 8 + 9 + 8

= 25

Difference = 25 – (8 + a)

= 17 – a

The difference should be 0 or a multiple of 11, then the number is divisible by 11

If 17 – a = 0

a = 17 (which is not possible)

Now, take a multiple of 11.

Let's take 11

17 – a = 11

a = 17 – 11

a = 6

Therefore the required digit is 6

Exercise 3.4

1. **Find the common factors of:**

(a) 20 and 28

(b) 15 and 25

(c) 35 and 50

(d) 56 and 120

Solutions:

(a) 20 and 28

1, 2, 4, 5, 10 and 20 are factors of 20

1, 2, 4, 7, 14 and 28 are factors of 28

Common factors = 1, 2, 4

(b) 15 and 25

1, 3, 5 and 15 are factors of 15

1, 5 and 25 are factors of 25

Common factors = 1, 5

(c) 35 and 50

1, 5, 7 and 35 are factors of 35

1, 2, 5, 10, 25 and 50 are factors of 50

Common factors = 1, 5

(d) 56 and 120

1, 2, 4, 7, 8, 14, 28 and 56 are factors of 56

1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60 and 120 are factors of 120

Common factors = 1, 2, 4, 8

2. Find the common factors of:

(a) 4, 8 and 12

(b) 5, 15 and 25

Solutions:

(a) 4, 8 and 12

1, 2, 4 are factors of 4

1, 2, 4, 8 are factors of 8

1, 2, 3, 4, 6, 12 are factors of 12

Common factors = 1, 2, 4

(b) 5, 15 and 25

1, 5 are factors of 5

1, 3, 5, 15 are factors of 15

1, 5, 25 are factors of 25

Common factors = 1, 5

3. Find the first three common multiples of:

(a) 6 and 8

(b) 12 and 18

Solutions:

(a) 6 and 8

6, 12, 18, 24, 30 are multiples of 6

8, 16, 24, 32 are multiples of 8

Three common multiples are 24, 48, 72

(b) 12 and 18

12, 24, 36, 48 are multiples of 12

18, 36, 54, 72 are multiples of 18

Three common factors are 36, 72, 108

4. Write all the numbers less than 100, which are common multiples of 3 and 4.

Solutions:

Multiples of 3 are 3, 6, 9, 12, 15

Multiples of 4 are 4, 8, 12, 16, 20

Common multiples are 12, 24, 36, 48, 60, 72, 84 and 96

5. Which of the following numbers are co-prime?

(a) 18 and 35

(b) 15 and 37

(c) 30 and 415

(d) 17 and 68

(e) 216 and 215

(f) 81 and 16

Solutions:

(a) 18 and 35

Factors of 18 are 1, 2, 3, 6, 9, 18

Factors of 35 are 1, 5, 7, 35

Common factor = 1

Since their common factor is 1. Hence, the given two numbers are co-prime

(b) 15 and 37

Factors of 15 are 1, 3, 5, 15

Factors of 37 are 1, 37

Common factors = 1

Since their common factor is 1. Hence, the given two numbers are co-prime

(c) 30 and 415

Factors of 30 are 1, 2, 3, 5, 6, 10, 15, 30

Factors of 415 are 1, 5, 83, 415

Common factors = 1, 5

Since their common factor is other than 1. Hence, the given two numbers are not co-prime

(d) 17 and 68

Factors of 17 are 1, 17

Factors of 68 are 1, 2, 4, 17, 34, 68

Common factors = 1, 17

Since their common factor is other than 1. Hence, the given two numbers are not co-prime

(e) 216 and 215

Factors of 216 are 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 27, 36, 54, 72, 108, 216

Factors of 215 are 1, 5, 43, 215

Common factors = 1

Since their common factor is 1. Hence, the given two numbers are co-prime

(f) 81 and 16

Factors of 81 are 1, 3, 9, 27, 81

Factors of 16 are 1, 2, 4, 8, 16

Common factors = 1

Since their common factor is 1. Hence, the given two numbers are co-prime

6. A number is divisible by both 5 and 12. By which other number will that number always be divisible?

Solutions:

Factors of 5 are 1, 5

Factors of 12 are 1, 2, 3, 4, 6, 12

Their common factor = 1

Since their common factor is 1. The given two numbers are co-prime and are also divisible by their product 60

Factors of 60 are 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60

7. A number is divisible by 12. By what other numbers will that number be divisible?

Solutions:

Since the number is divisible by 12. Hence, it also divisible by its factors i.e., 1, 2, 3, 4, 6, 12

Therefore 1, 2, 3, 4, and 6 are the numbers other than 12 by which this number is also divisible

Exercise 3.5

1. Which of the following statements is true?

(a) If a number is divisible by 3, it must be divisible by 9.

(b) If a number is divisible by 9, it must be divisible by 3.

(c) A number is divisible by 18, if it is divisible by both 3 and 6.

(d) If a number is divisible by 9 and 10, then it must be divisible by 90.

(e) If two numbers are co-primes, at least one of them must be prime.

(f) All numbers which are divisible by 4 must also be divisible by 8.

(g) All numbers which are divisible by 8 must also be divisible by 4.

(h) If a number exactly divides two numbers separately, it must exactly divide their sum.

(i) If a number exactly divides the sum of two numbers, it must exactly divide the two numbers separately.

Solutions:

(a) False, 6 is divisible by 3 but is not divisible by 9

(b) True, as 9 = 3 × 3. Hence, if a number is divisible by 9, it will also be divisible by 3

(c) False. Since 30 is divisible by both 3 and 6 but is not divisible by 18

(d) True, as 9 × 10 = 90. Hence, if a number is divisible by both 9 and 10 then it is divisible by 90

(e) False. Since 15 and 32 are co-primes and also composite numbers

(f) False, as 12 is divisible by 4 but is not divisible by 8

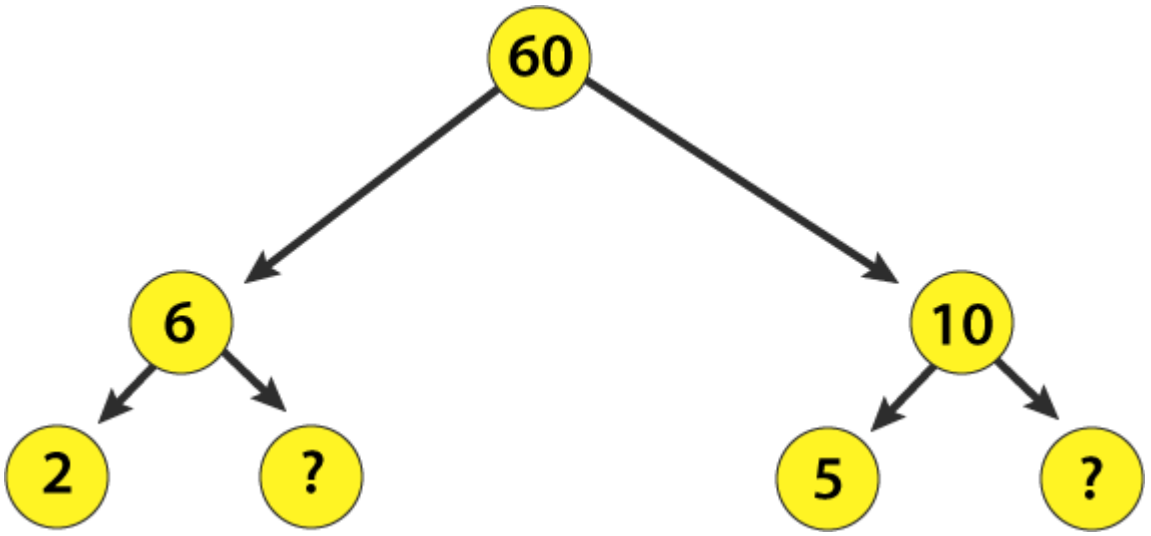
(g) True, as 2 × 4 = 8. Hence, if a number is divisible by 8, it will also be divisible by 2 and 4

(h) True, as 2 divides 4 and 8, and it also divides 12 (4 + 8 = 12)

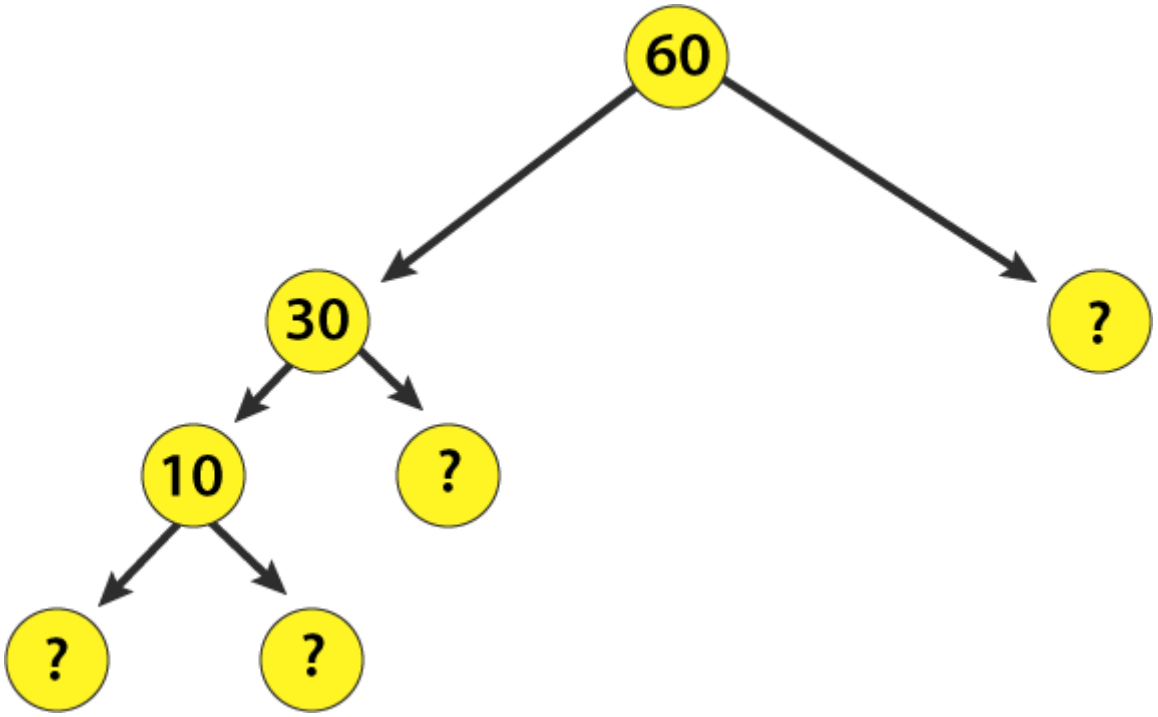
(i) False, since 2 divides 12 but it does not divide 7 and 5

2. Here are two different factor trees for 60. Write the missing numbers.

(a)

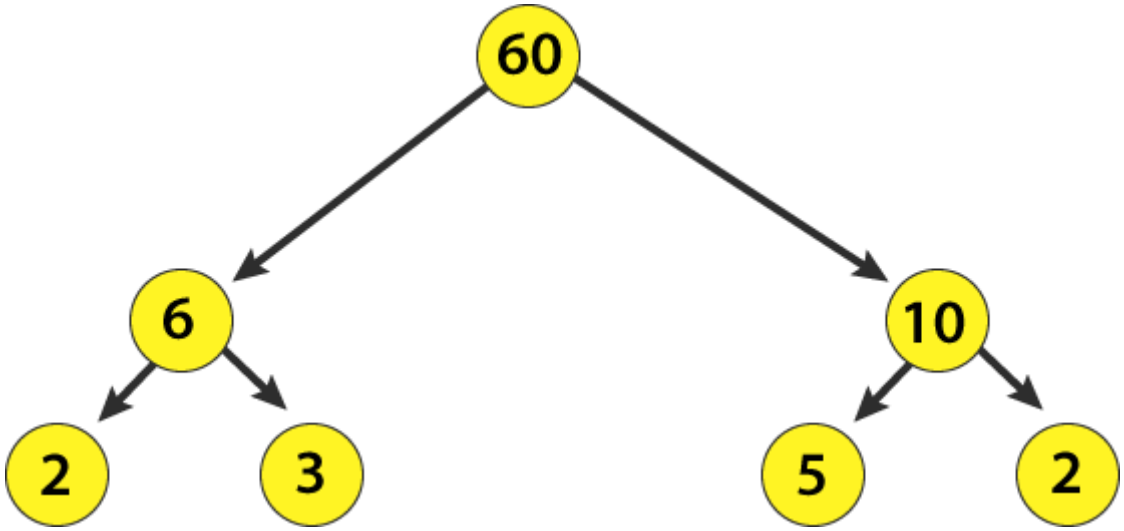


(b)



Solutions:

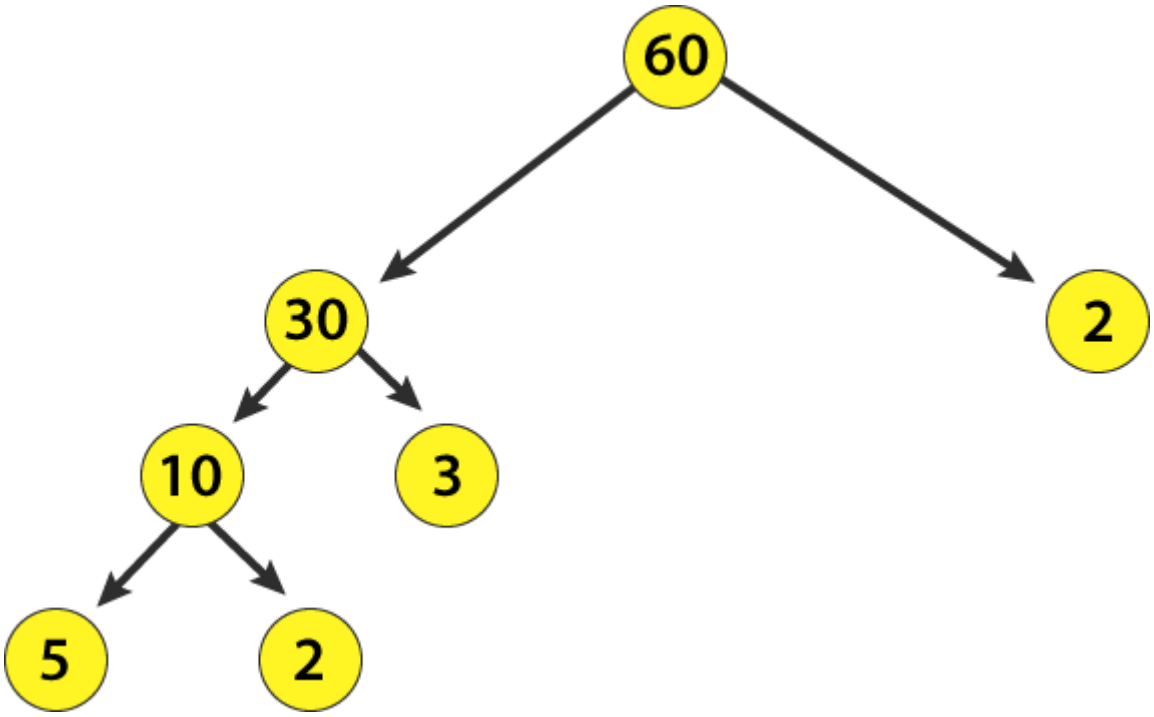
(a) Since 6 = 2 × 3 and 10 = 5 × 2



(b) Since 60 = 30 × 2

30 = 10 × 3

10 = 5 × 2



3. Which factors are not included in the prime factorisation of a composite number?

Solutions:

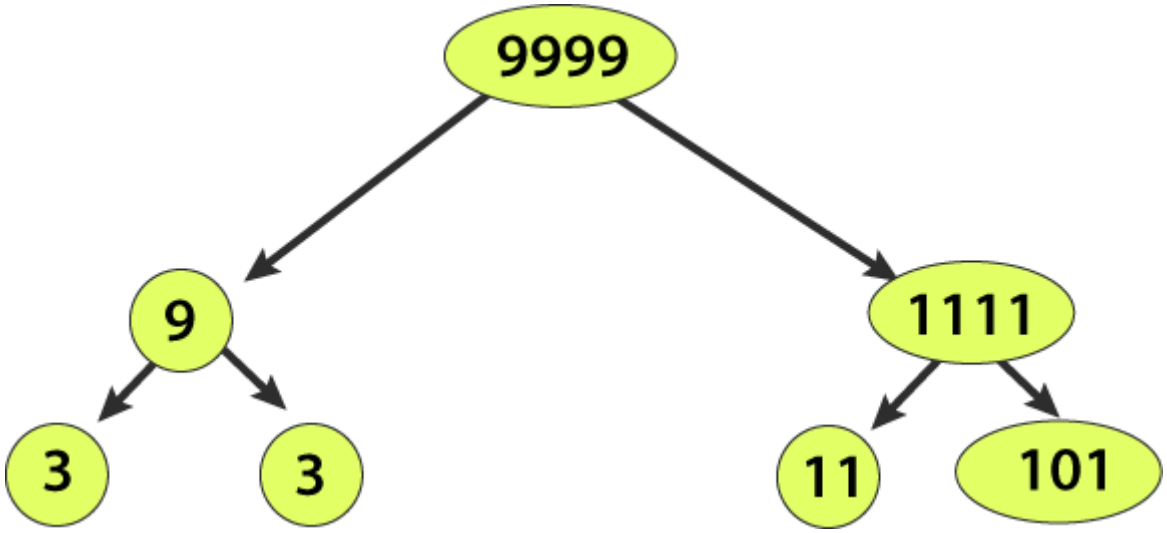
1 and the number itself are not included in the prime factorisation of a composite number.

4. Write the greatest 4-digit number and express it in terms of its prime factors.

Solutions:

The greatest four-digit number is 9999

Therefore 9999 = 3 × 3 × 11 × 101



(c) 70 = 2 × 5 × 7

Since all the factors are prime. Hence, prime factorisation has been done

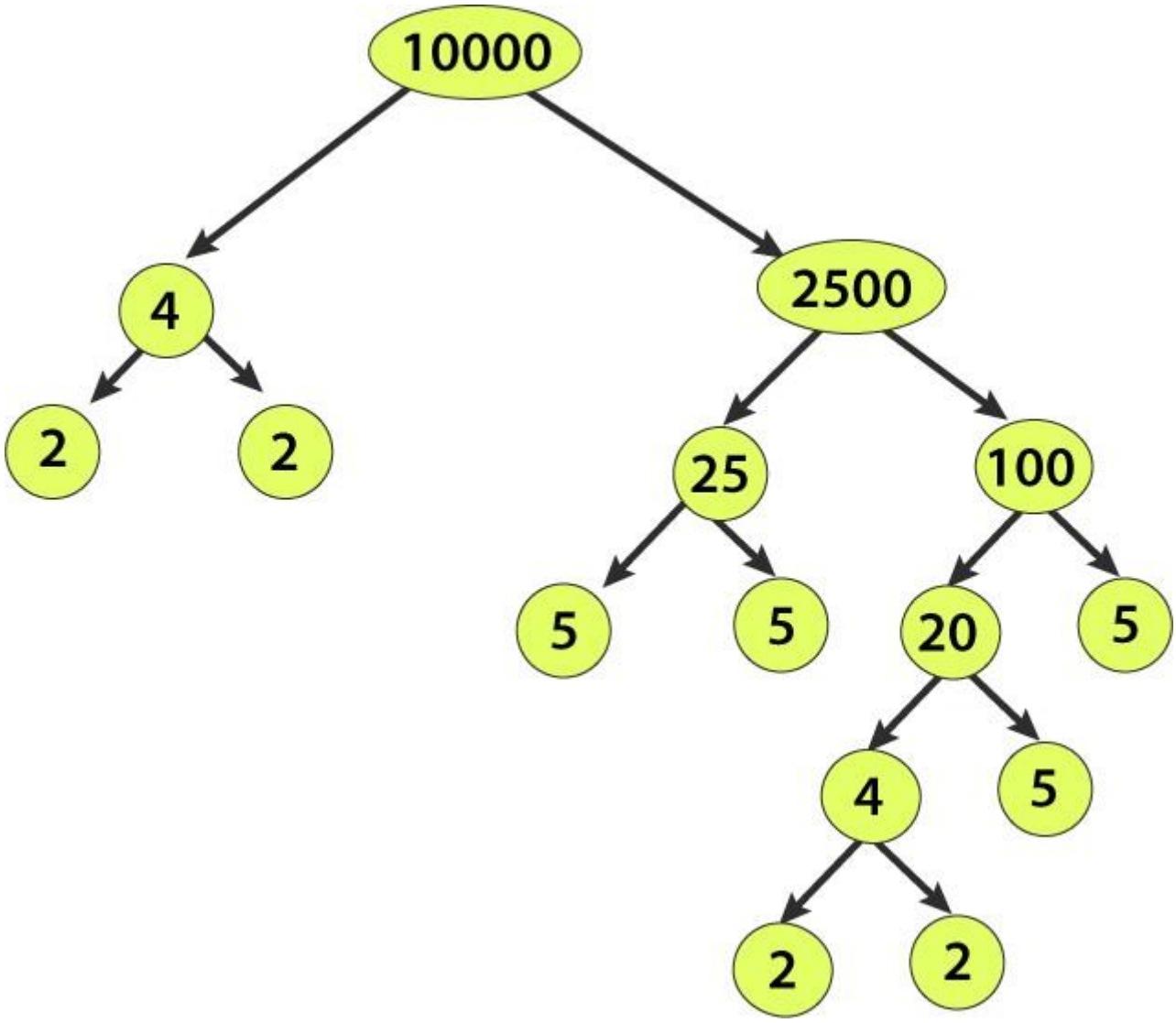
(d) 54 = 2 × 3 × 9

Since 9 is composite. Hence prime factorisation has not been done

5. Write the smallest 5-digit number and express it in the form of its prime factors.

Solutions:

The smallest five-digit number = 10000



10000 = 2 × 2 × 2 × 2 × 5 × 5 × 5 × 5

6. Find all the prime factors of 1729 and arrange them in ascending order. Now state the relation, if any, between two consecutive prime factors.

Solutions:

7	1729
13	247
19	19
	1

1729 = 7 × 13 × 19

13 – 7 = 6

19 – 13 = 6

Hence, the difference between two consecutive prime factors is 6.

7. The product of three consecutive numbers is always divisible by 6. Verify this statement with the help of some examples.

Solutions:

(i) 2 × 3 × 4 = 24 which is divisible by 6

(ii) 5 × 6 × 7 = 210 which is divisible by 6

8. In which of the following expressions has prime factorisation been done?

(a) 24 = 2 × 3 × 4

(b) 56 = 7 × 2 × 2 × 2

(c) 70 = 2 × 5 × 7

(d) 54 = 2 × 3 × 9

Solutions:

(a) 24 = 2 × 3 × 4

Since 4 is composite. Hence, prime factorisation has not been done

(b) 56 = 7 × 2 × 2 × 2

Since all the factors are prime. Hence, prime factorisation has been done

(c) 70 = 2 × 5 × 7

Since all the factors are prime. Hence, prime factorisation has been done

(d) 54 = 2 × 3 × 9

Since 9 is composite. Hence prime factorisation has not been done.

Q9) Do yourself (same as Q6).

10. Determine if 25110 is divisible by 45. [Hint: 5 and 9 are co-prime numbers. Test the divisibility of the number by 5 and 9].

Solutions:

45 = 5 × 9

1, 5 are factors of 5

1, 3, 9 are factors of 9

Hence, 5 and 9 are co-prime numbers

The last digit of 25110 is 0. Hence, it is divisible by 5

Sum of digits 25110

2 + 5 + 1 + 1 + 0

= 9

Since the sum of digits of 25110 is divisible by 9. Hence, 25110 is divisible by 9

Since the number is divisible by both 5 and 9

Therefore 25110 is divisible by 45

11. 18 is divisible by both 2 and 3. It is also divisible by 2 × 3 = 6. Similarly, a number is divisible by both 4 and 6. Can we say that the number must also be divisible by 4 × 6 = 24? If not, give an example to justify your answer.

Solutions:

No, since 12 and 36 are both divisible by 4 and 6. But 12 and 36 are not divisible by 24

12. I am the smallest number, having four different prime factors. Can you find me?

Solutions:

Since it is the smallest number. Therefore it will be the product of 4 smallest prime numbers

$2 \times 3 \times 5 \times 7 = 210$

Exercise 3.6

1. Find the HCF of the following numbers :

(a) 18, 48

(b) 30, 42

(c) 18, 60

(d) 27, 63

(e) 36, 84

(f) 34, 102

(g) 70, 105, 175

(h) 91, 112, 49

(i) 18, 54, 81

(j) 12, 45, 75

Solutions:

(a) 18, 48

2	18
3	9
3	3
	1

2	48
2	24
2	12
2	6
3	3
	1

$18 = 2 \times 3 \times 3$

$48 = 2 \times 2 \times 2 \times 2 \times 3$

$HCF = 2 \times 3 = 6$

Therefore the HCF of 18, 48 is 6

(b) 30, 42

2	30
3	15
5	5
	1

2	42
3	21
7	7
	1

30 = 2 × 3 × 5

42 = 2 × 3 × 7

HCF = 2 × 3 = 6

Therefore the HCF of 30, 42 is 6

(c) 18, 60

2	18
3	9
3	3
	1

2	60
2	30
3	15
5	5
	1

18 = 2 × 3 × 3

60 = 2 × 2 × 3 × 5

HCF = 2 × 3 = 6

Therefore the HCF of 18, 60 is 6

(d) 27, 63

3	27
3	9
3	3
	1

3	63
3	21
7	7
	1

27 = 3 × 3 × 3

63 = 3 × 3 × 7

HCF = 3 × 3 = 9

Therefore the HCF of 27, 63 is 9

(e) 36, 84

2	36
2	18
3	9
3	3
	1

2	84
2	42
3	21
7	7
	1

36 = 2 × 2 × 3 × 3

84 = 2 × 2 × 3 × 7

HCF = 2 × 2 × 3 = 12

Therefore the HCF of 36, 84 is 12

2. What is the HCF of two consecutive

(a) numbers?

(b) even numbers?

(c) odd numbers?

Solutions:

(a) The HCF of two consecutive numbers is 1

Example: The HCF of 2 and 3 is 1

(b) The HCF of two consecutive even numbers is 2

Example: The HCF of 2 and 4 is 2

(c) The HCF of two consecutive odd numbers is 1

Example: The HCF of 3 and 5 is 1

3. HCF of co-prime numbers 4 and 15 was found as follows by factorisation:

4 = 2 × 2 and 15 = 3 × 5 since there is no common prime factor, so HCF of 4 and 15 is 0. Is the answer correct? If not, what is the correct HCF?

Solutions:

No. The answer is not correct. The correct answer is 1.

Exercise 3.7

1. Renu purchases two bags of fertiliser of weights 75 kg and 69 kg. Find the maximum value of weight, which can measure the weight of the fertiliser exact number of times.

Solutions:

Given weight of two bags of fertiliser = 75 kg and 69 kg

Maximum weight = HCF of two bags weight i.e., (75, 69)

3	75
5	25
5	5
	1

3	69
23	23
	1

75 = 3 × 5 × 5

69 = 3 × 23

HCF = 3

Hence, 3 kg is the maximum value of weight which can measure the weight of the fertiliser exact number of times.

2. Three boys step off together from the same spot. Their steps measure 63 cm, 70 cm and 77 cm, respectively. What is the minimum distance each should cover so that all can cover the distance in complete steps?

Solutions:

The first boy's steps measure = 63 cm

The second boy's steps measure = 70 cm

Third boy's steps measure = 77 cm

LCM of 63, 70, 77

2	63	70	77
3	63	35	77
3	21	35	77
5	7	35	77
7	7	7	77
11	1	1	11
	1	1	1

LCM = 2 × 3 × 3 × 5 × 7 × 11 = 6930

Hence, 6930 cm is the distance each should cover so that all can cover the distance in complete steps.

3. The length, breadth and height of a room are 825 cm, 675 cm and 450 cm, respectively. Find the longest tape that can measure the room's three dimensions exactly.

Solutions:

Given the length of a room = 825 cm

The breadth of a room = 675 cm

Height of a room = 450 cm

3	825
5	275
5	55
11	11
	1

3	675
3	225
3	75
5	25
5	5
	1

2	450
3	225
3	75
5	25
5	5
	1

825 = 3 × 5 × 5 × 11

675 = 3 × 3 × 3 × 5 × 5

450 = 2 × 3 × 3 × 5 × 5

HCF = 3 × 5 × 5 = 75 cm

Hence longest tape is 75 cm which can measure the three dimensions of the room exactly.

4. Determine the smallest 3-digit number, which is exactly divisible by 6, 8 and 12.

Solutions:

LCM of 6, 8, 12 = smallest number

2	6	8	12
2	3	4	6
2	3	2	3
3	3	1	3
	1	1	1

LCM = 2 × 2 × 2 × 3 = 24

Now we need to find the smallest 3-digit multiple of 24

We know that 24 × 4 = 96 and 24 × 5 = 120

Hence, 120 is the smallest 3-digit number which is exactly divisible by 6, 8 and 12

5. Determine the greatest 3-digit number exactly divisible by 8, 10 and 12.

Solutions:

LCM of 8, 10 and 12

2	8	10	12
2	4	5	6
2	2	5	3
3	1	5	3
5	1	5	1
	1	1	1

LCM = 2 × 2 × 2 × 3 × 5 = 120

Now we need to find the greatest 3-digit multiple of 120

We may find 120 × 8 = 960 and 120 × 9 = 1080

Hence, 960 is the greatest 3-digit number exactly divisible by 8, 10 and 12

6. The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds, respectively. If they change simultaneously at 7 a.m., at what time will they change simultaneously again?

Solutions:

LCM of 48, 72, 108 = time period after which these lights change

2	48	72	108
2	24	36	54
2	12	18	27
2	6	9	27
3	3	9	27
3	1	3	9
3	1	1	3
	1	1	1

LCM = 2 × 2 × 2 × 2 × 3 × 3 × 3 = 432

Hence, lights will change together after every 432 seconds

Therefore the lights will change simultaneously at 7 minutes and 12 seconds.

7. Three tankers contain 403 litres, 434 litres and 465 litres of diesel, respectively. Find the maximum capacity of a container that can measure the diesel of the three containers the exact number of times.

Solutions:

HCF of 403, 434, 465 = Maximum capacity of tanker required

403 = 13 × 31

434 = 2 × 7 × 31

465 = 3 × 5 × 31

HCF = 31

Hence, a container of 31 litres can measure the diesel of the three containers the exact number of times.

8. Find the least number, which, when divided by 6, 15 and 18 leave the remainder 5 in each case.

Solutions:

LCM of 6, 15, 18

2	6	15	18
3	3	15	9
3	1	5	3
5	1	5	1
	1	1	1

LCM = 2 × 3 × 3 × 5 = 90

Required number = 90 + 5

= 95

Hence, 95 is the required number.

9. Find the smallest 4-digit number, which is divisible by 18, 24 and 32.

Solutions:

LCM of 18, 24, 32

2	18	24	32
2	9	12	16
2	9	6	8
2	9	3	4
2	9	3	2
3	9	3	1
3	3	1	1
	1	1	1

LCM = 2 × 2 × 2 × 2 × 2 × 3 × 3 = 288

Here, we need to find the smallest 4-digit multiple of 288

We find 288 × 3 = 864 and 288 × 4 = 1152

Hence, 1152 is the smallest 4-digit number which is divisible by 18, 24 and 32

10. Find the LCM of the following numbers:

(a) 9 and 4 (b) 12 and 5 (c) 6 and 5 (d) 15 and 4

Observe a common property in the obtained LCMs. Is LCM the product of two numbers in each case?

Solutions:

(a) LCM of 9, 4

2	9	4
2	9	2
3	9	1
3	3	1
	1	1

LCM = 2 × 2 × 3 × 3 = 36

(b) LCM of 12, 5

2	12	5
2	6	5
3	3	5
5	1	5
	1	1

LCM = 2 × 2 × 3 × 5 = 60

(c) LCM of 6, 5

2	6	5
3	3	5
5	1	5
	1	1

LCM = 2 × 3 × 5 = 30

(d) LCM of 15, 4

2	15	4
2	15	2
3	15	1
5	5	1
	1	1

LCM = 2 × 2 × 3 × 5 = 60

Yes in each case the LCM of given numbers is the product of these numbers.

11. Find the LCM of the following numbers in which one number is the factor of the other.

(a) 5, 20 (b) 6, 18 (c) 12, 48 (d) 9, 45

What do you observe in the results obtained?

Solutions:

(a) 5, 20

2	5	20
2	5	10
5	5	5
	1	1

LCM = 2 × 2 × 5 = 20

(b) 6, 18

2	6	18
3	3	9
3	1	3
	1	1

LCM = 2 × 3 × 3 = 18

(c) 12, 48

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

LCM = 2 × 2 × 2 × 2 × 3 = 48

(d) 9, 45

3	9	45
3	3	15
5	1	5
	1	1

LCM = 3 × 3 × 5 = 45

∴ Hence, in each case the LCM of given numbers is the larger number. When a number is a factor of other number then their LCM will be the larger number.