HCF and LCM

PRACTICE SET 10 [PAGE 15]

Practice Set 10 | Q 1 | Page 15

Which number is neither a prime number nor a composite number?

Solution: 1 is neither a prime number nor a composite number.

Practice Set 10 | Q 2 | Page 15

Which of the following are pairs of co-primes?

(i) 8, 14

(ii) 4, 5

(iii) 17, 19

(iv) 27, 15

Solution: Two numbers that have only 1 as a common factor are said to be co-prime or relatively prime or mutually prime numbers.

We can write 17 as 17 × 1 and 19 as 17 × 1.

Hence, 17 and 19 is a pair of co-prime numbers.

Practice Set 10 | Q 3 | Page 15

List the prime numbers from 25 to 100 and say how many they are.

Solution: There are a total of 16 prime numbers between 25 and 100 which are 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97.

Practice Set 10 | Q 4 | Page 15

Write all the twin prime numbers from 51 to 100.

Solution: If the difference between two co-prime numbers is 2, the numbers are said to be twin prime numbers.

Hence, the twin prime numbers between 51 and 100 are 59 and 61, 71, and 73.

Practice Set 10 | Q 5 | Page 15

Write 5 pairs of twin prime numbers from 1 to 50.

Solution: If the difference between two co-prime numbers is 2 then, the numbers are said to be twin prime numbers.
Hence, the twin prime numbers from 1 to 50 are (2,3), (5,7), (11,12), (17,19) and (29,30).

Practice Set 10 | Q 6 | Page 15

Which are the even prime numbers?
Solution: There is only an even prime number which is 2.

PRACTICE SET 11 [PAGE 17]

Practice Set 11 | Q 1.01 | Page 17

Factorise the following number into prime.
32

Solution: 32 = 2 × 16
= 2 × 2 × 8
= 2 × 2 × 2 × 4
= 2 × 2 × 2 × 2 × 2

Practice Set 11 | Q 1.02 | Page 17

Factorise the following number into prime.
57

Solution: 57 = 3 × 19

Practice Set 11 | Q 1.03 | Page 17

Factorise the following number into prime.
23

Solution: 23 = 23 × 1

Practice Set 11 | Q 1.04 | Page 17

Factorise the following number into prime.
150

Solution: 150 = 2 × 75

= 2 × 3 × 25

= 2 × 3 × 5 × 5

Practice Set 11 | Q 1.05 | Page 17

Factorise the following number into prime.

216

Solution: 216 = 2 × 108

= 2 × 2 × 54

= 2 × 2 × 2 × 27

= 2 × 2 × 2 × 3 × 9

= 2 × 2 × 2 × 3 × 3 × 3

Practice Set 11 | Q 1.06 | Page 17

Factorise the following number into prime.

208

Solution: 208 = 2 × 104

= 2 × 2 × 52

= 2 × 2 × 2 × 26

= 2 × 2 × 2 × 2 × 13

Practice Set 11 | Q 1.07 | Page 17

Factorise the following number into prime.

765

Solution: 765 = 3 × 255

= 3 × 3 × 85

= 3 × 3 × 5 × 17

Practice Set 11 | Q 1.08 | Page 17

Factorise the following number into prime.

342

Solution: 342 = 2 × 171

= 2 × 3 × 57

= 2 × 3 × 3 × 19

Practice Set 11 | Q 1.09 | Page 17

Factorise the following number into prime.

377

Solution: 377 = 13 × 29

Practice Set 11 | Q 1.1 | Page 17

Factorise the following number into prime.

559

Solution: 559 = 13 × 43

PRACTICE SET 12 [PAGE 19]

Practice Set 12 | Q 1.01 | Page 19

Find the HCF: 25, 40

Solution:

5	25,40
	5, 8

HCF = 5

Practice Set 12 | Q 1.02 | Page 19

Find the HCF: 56, 32

Solution:

2	56,32
2	28,16
2	14, 8
	7, 4

HCF = 2 × 2 × 2= 8

Practice Set 12 | Q 1.03 | Page 19

Find the HCF: 40, 60, 75

Solution:

5	40,60,75
	8,12,15

HCF = 5

Practice Set 12 | Q 1.04 | Page 19

Find the HCF: 16, 27

Solution:

1	16,27
	16,27

HCF = 1

Practice Set 12 | Q 1.05 | Page 19

Find the HCF: 18, 32, 48

Solution:

2	18,32,48
	9, 16, 24

HCF = 2

Practice Set 12 | Q 1.06 | Page 19

Find the HCF: 105, 154

Solution:

7	105,154
	15, 22

HCF = 7

Practice Set 12 | Q 1.07 | Page 19

Find the HCF: 42, 45, 48

Solution:

3	42,45,48
	14,15,16

HCF = 3

Practice Set 12 | Q 1.08 | Page 19

Find the HCF: 57, 75, 102

Solution:

3	57,75,102
	19, 25, 34

HCF = 3

Practice Set 12 | Q 1.09 | Page 19

Find the HCF: 56, 57

Solution:

1	56,57
	56,57

HCF = 1

Practice Set 12 | Q 1.1 | Page 19

Find the HCF: 777, 315, 588

Solution:

3	777,315,588
7	259,105,196
	37, 15, 28

HCF = 3 × 7 = 21

Practice Set 12 | Q 2.1 | Page 19

Find the HCF by the division method and reduce to the simplest form.

$$\frac{275}{525}$$

Solution:

$$275\overline{)525}(1$$
$$275$$
$$250\overline{)275}(1$$
$$250$$
$$25\overline{)250}(10$$
$$250$$
$$x$$

HCF = 25

$$\therefore \frac{275}{525} = \frac{275 \div 25}{525 \div 25} = \frac{11}{21}$$

Practice Set 12 | Q 2.2 | Page 19

Find the HCF by the division method and reduce to the simplest form.

$$\frac{76}{133}$$

Solution:

$$76\overline{)133}(1$$
$$76$$
$$57\overline{)76}(1$$
$$57$$
$$19\overline{)57}(3$$
$$57$$
$$x$$

HCF = 19

$$\therefore \frac{76}{133} = \frac{76 \div 19}{133 \div 19} = \frac{4}{7}$$

Practice Set 12 | Q 2.3 | Page 19

Find the HCF by the division method and reduce to the simplest form.

$$\frac{161}{69}$$

Solution:

$$69\overline{)161}(2$$
$$138$$
$$23\overline{)69}(3$$
$$69$$
$$x$$

HCF = 23

$$\therefore \frac{161}{69} = \frac{161 \div 23}{69 \div 23} = \frac{7}{3}$$

PRACTICE SET 13 [PAGE 21]

Practice Set 13 | Q 1.01 | Page 21

Find the LCF: 12, 15

Solution:

3	12, 15
5	4, 5
4	4, 1
	1, 1

LCM = 3 × 5 × 4 = 60

Practice Set 13 | Q 1.02 | Page 21

Find the LCF: 6, 8, 10

Solution:

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

LCM = 2 × 3 × 4 × 5 = 120

Practice Set 13 | Q 1.03 | Page 21

Find the LCF: 18, 32

Solution:

2	18,32
9	9, 16
16	1, 16
	1, 1

LCM = 2 × 9 × 16 = 288

Practice Set 13 | Q 1.04 | Page 21

Find the LCF: 10, 15, 20

Solution:

2	10,15,20
5	5, 15, 10
2	1, 3, 2
3	1, 3, 1
	1, 1, 1

LCM = 2 × 2 × 3 × 5 = 60

Practice Set 13 | Q 1.05 | Page 21

Find the LCF: 45, 86

Solution:

45	45,86
86	1, 86
	1,1

LCM = 45 × 86 = 3870

Practice Set 13 | Q 1.06 | Page 21

Find the LCF: 15, 30, 90

Solution:

2	15,30,90
3	15,15,45
5	5,5,15
3	1,1,3
	1,1,1

LCM = 2 × 3 × 5 × 3 = 90

Practice Set 13 | Q 1.07 | Page 21

Find the LCF: 105, 195

Solution:

3	105,195
5	35,65
7	7,13
13	1,13
	1,1

LCM = 3 × 5 × 7 × 13 = 1365

Practice Set 13 | Q 1.08 | Page 21

Find the LCF: 12, 15, 45

Solution:

3	12,15,45

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

LCM = 3 × 5 × 7 × 13 = 1365

Practice Set 13 | Q 1.09 | Page 21

Find the LCF: 63, 81

Solution:

3	63, 81
3	21, 27
3	7, 9
3	7, 3
7	7, 1
	1, 1

LCM = 3 × 3 × 3 × 3 × 5 = 567

Practice Set 13 | Q 1.1 | Page 21

Find the LCF: 18, 36, 27

Solution:

2	18,36,27
2	9, 18, 27
3	9, 9, 27
3	3, 3, 9
3	1, 1, 3
	1, 1, 1

LCM = 2 × 2 × 3 × 3 × 3 = 108

Practice Set 13 | Q 2.1 | Page 21

Find the HCF and LCM of the number given below. Verify that their product is equal to the product of the given numbers.

32, 37

Solution:

1	32, 37
	32, 37

HCF = 1

LCM = 32 × 37 = 1184

Product of two numbers = 32 × 37 = 1184

Product of HCF and LCM = 1 × 1184 = 1184

Practice Set 13 | Q 2.2 | Page 21

Find the HCF and LCM of the number given below. Verify that their product is equal to the product of the given numbers.

46, 51

Solution:

1	46, 51
	46, 51

HCF = 1

LCM = 46 × 51 = 2346

Product of two numbers = 46 × 51 = 2346

Product of HCF and LCM = 1 × 2346 = 2346

Practice Set 13 | Q 2.3 | Page 21

Find the HCF and LCM of the number given below. Verify that their product is equal to the product of the given numbers.

15, 60

Solution:

3	15, 60
5	5, 20
	1, 4

HCF = 3 × 5 = 15

LCM = 3 × 5 × 4 = 60

Product of two numbers = 15 × 60 = 900

Product of HCF and LCM = 15 × 60 = 900

Practice Set 13 | Q 2.4 | Page 21

Find the HCF and LCM of the number given below. Verify that their product is equal to the product of the given numbers.

18, 63

Solution:

3	18, 63
3	6, 21
	2, 7

HCF = 3 × 3 = 9

LCM = 3 × 3 × 2 × 7 = 126

Product of two numbers = 18 × 63 = 1134

Product of HCF and LCM = 9 × 126 = 1134

Practice Set 13 | Q 2.5 | Page 21

Find the HCF and LCM of the number given below. Verify that their product is equal to the product of the given numbers.

78, 104

Solution:

2	78, 104
13	39, 52
	3, 4

HCF = 2 × 13 = 26

LCM = 2 × 13 × 3 × 4 = 312

Product of two numbers = 78 × 104 = 8112

Product of HCF and LCM = 26 × 312 = 8112

PRACTICE SET 14 [PAGE 23]

Practice Set 14 | Q 1.1 | Page 23

Choose the right option.

The HCF of 120 and 150 is _____.

1. **30**
2. 45
3. 20
4. 120

Solution: The HCF of 120 and 150 is **30**.

Explanation:

2	120,150
3	60, 75
5	20, 15
	4, 3

HCF = 2 × 3 × 5 = 30

Practice Set 14 | Q 1.2 | Page 23

Choose the right option.

The HCF of this pair of numbers is not 1.

1. 13, 17
2. 29, 20
3. **40, 20**
4. 14, 15

Solution: 40, 20

Explanation:

40 = 2 × 2 × 2 × 5

20 = 2 × 2 × 5

The HCF of 20 and 40 is 2 × 2 × 5 or 20.

Practice Set 14 | Q 2.1 | Page 23

Find the HCF and LCM: 14, 28

Solution:

2	14,28
7	7, 14

	1, 2

HCF = 2 × 7 = 14
LCM = 2 × 7 × 2 = 28

Practice Set 14 | Q 2.2 | Page 23

Find the HCF and LCM: 32, 16

Solution:

2	32,16
2	16, 8
2	8, 4
2	4, 2
	2, 1

HCF = 2 × 2 × 2 × 2 = 16

LCM = 2 × 2 × 2 × 2 × 2 = 32

Practice Set 14 | Q 2.3 | Page 23

Find the HCF and LCM: 17, 102, 170

Solution:

17	17,102,170
	1, 6, 10

HCF = 17

LCM = 17 × 2 × 3 × 5 = 510

Practice Set 14 | Q 2.4 | Page 23

Find the HCF and LCM: 23, 69

Solution:

23	23,69
	1, 3

HCF = 23

LCM = 23 × 3 = 69

Practice Set 14 | Q 2.5 | Page 23

Find the HCF and LCM: 21, 49, 84

Solution:

7	21,49,84
	3, 7, 12

HCF = 7

LCM = 3 × 4 × 7 × 7 = 588

Practice Set 14 | Q 3.1 | Page 23

Find the LCM: 36, 42

Solution:

2	36,42
2	18,21
3	9,21
3	3,7
7	1,7
	1,1

LCM = 2 × 2 × 3 × 3 × 7 = 252

Practice Set 14 | Q 3.2 | Page 23

Find the LCM: 15, 25, 30

Solution:

2	15,25,30
3	15,25,15
5	5,25,5
5	1,5,1
	1,1,1

LCM = 2 × 3 × 5 × 5 = 150

Practice Set 14 | Q 3.3 | Page 23

Find the LCM: 18, 42, 48

Solution:

2	18,42,48
3	9,21,24
2	9,21,12
2	9,21,6
3	9,21,3
3	3,7,1
7	1,7,1
	1,1,1

LCM = 2 × 2 × 2 × 2 × 3 × 3 × 7 = 1008

Practice Set 14 | Q 3.4 | Page 23

Find the LCM: 4, 12, 20

Solution:

2	4,12,20
2	2,6,10
3	1, 3, 5
5	1, 1, 5
	1, 1, 1

LCM = 2 × 2 × 3 × 5 = 60

Practice Set 14 | Q 3.5 | Page 23

Find the LCM: 24, 40, 80, 120

Solution:

2	24,40,80,120
2	12,20,40,60
2	6, 10, 20, 30
2	3, 5, 10, 15
3	3, 5, 5, 15
5	1, 5, 5, 5

	1, 1, 1, 1

LCM = 2 × 2 × 2 × 2 × 3 × 5 = 240

Practice Set 14 | Q 4 | Page 23

Find the smallest number which when divided by 8, 9, 10, 15, 20 gives a remainder of 5 every time.

Solution: LCM of 8, 9, 10, 15, 20 is given by

2	8,9,10,15,20
2	4,9,5,15, 10
3	2, 9, 5, 15,5
2	2, 3, 5, 5, 5
3	1, 3, 5, 5, 5
5	1, 1, 5, 5, 5
	1, 1, 1, 1

LCM = 2 × 2 × 2 × 3 × 3 × 5 = 360

Hence, 365 is the smallest number which when divided by 8, 9, 10, 15, 20 gives a remainder of 5 every time.

Practice Set 14 | Q 5 | Page 23

Reduce the fractions $\frac{348}{319}, \frac{221}{247}, \frac{437}{551}$ to the lowest terms.

Solution:

$$\frac{348}{319} = \frac{348 \div 29}{319 \div 29}$$

$$= \frac{12}{11}$$

$$\frac{221}{247} = \frac{221 \div 13}{247 \div 13}$$

$$= \frac{17}{19}$$

$$\frac{437}{551} = \frac{437 \div 19}{551 \div 19}$$

$$= \frac{23}{29}$$

Practice Set 14 | Q 6 | Page 23

The LCM and HCF of two numbers are 432 and 72 respectively. If one of the numbers is 216, what is the other ?

Solution:

Let the other number be x.

Now, HCF × LCM = Product of two numbers

$\Rightarrow 72 \times 432 = x \times 216$

$$\Rightarrow x = \frac{72 \times 432}{216}$$

$= 144$

Hence, the other number is 144.

Practice Set 14 | Q 7 | Page 23

The product of two two-digit numbers is 765 and their HCF is 3. What is their LCM?

Solution: HCF × LCM = Product of two numbers

⇒ 3 × LCM = 765

⇒ LCM = 765/3

= 255

Hence, the LCM of the two numbers is 255.

Practice Set 14 | Q 8 | Page 23

A trader has three bundles of string 392 m, 308 m and 490 m long. What is the great est length of string that the bundles can be cut up into without any left over string?

Solution: The greatest length of string that the bundles can be cut up into without any left over the string is given by the HCF of 392, 308, and 490.

2	392,308,490
7	196,154,245
	28,22,35

HCF = 2 × 7 = 14

Hence, the greatest length of string that the bundles can be cut up into without any left over string is 14 m.

Practice Set 14 | Q 9 | Page 23

Which two consecutive even numbers have an LCM of 180?

Solution: Let us suppose the two consecutive even numbers be 2x and 2x + 2.

Now, product of two numbers = HCF × LCM

⇒ (2x)(2x + 2) = 2 × 180 (HCM of two even number is 2)

⇒ (x)(2x + 2) = 180

⇒ $2x^2 + 2x = 180$

⇒ $2x^2 + 2x - 180 = 0$

⇒ $x^2 + x - 90 = 0$

⇒ (x − 9)(x + 10) = 0

⇒ x − 9 = 0 or x + 10 = 0

⇒ x = 9 or x = −10 (Neglecting)

Hence, the two consecutive even numbers are18 and 20.