Chapter 9: HCF-LCM

PRACTICE SET 23 [PAGE 46]

Practice Set 23 | Q 1 | Page 46
Write all the factor of the given number and list their common factor.
12, 16

SOLUTION

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

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

Common factors of 12 and 16: 1, 2, 4

Practice Set 23 | Q 2 | Page 46
Write all the factor of the given number and list their common factor.
21, 24

SOLUTION

Factors of 21: 1, 3, 7, 21

Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24

Common factors of 21 and 24: 1, 3

Practice Set 23 | Q 3 | Page 46
Write all the factor of the given number and list their common factor.
25, 30

SOLUTION

Factors of 25: 1, 5, 25

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

Common factors of 25 and 30: 1, 5

Practice Set 23 | Q 4 | Page 46
Write all the factor of the given number and list their common factor.
24, 25

SOLUTION

Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24

Factors of 25: 1, 5, 25

Common factors of 24 and 25: 1

Practice Set 23 | Q 5 | Page 46

Write all the factor of the given number and list their common factor.

56, 72

SOLUTION

Factors of 56: 1, 2, 4, 7, 8, 14, 28, 56

Factors of 72: 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72

Common factors of 56 and 72: 1, 2, 4, 8

PRACTICE SET 24 [PAGE 47]

Practice Set 24 | Q 1.01 | Page 47

Find the HCF of the following number.

45, 30

SOLUTION

Factors of 45: 1, 3, 5, 9, 15, 45

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

Common factors of 45 and 30: 1, 3, 5, 15

∴ HCF of 45 and 30 = 15

Practice Set 24 | Q 1.02 | Page 47

Find the HCF of the following number.

16, 48

SOLUTION

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

Factors of 48: 1, 2, 3, 4, 6, 8, 12, 16, 24, 48

Common factors of 16 and 48: 1, 2, 4, 8, 16

∴ HCF of 16 and 48 = 16

Practice Set 24 | Q 1.03 | Page 47

Find the HCF of the following number.

39, 25

SOLUTION

Factors of 39: 1, 3, 13, 39

Factors of 25: 1, 5, 25

Common factors of 39 and 25: 1

∴ HCF of 39 and 25 = 1

Practice Set 24 | Q 1.04 | Page 47
Find the HCF of the following number.
49, 56

SOLUTION

Factors of 49: 1, 7, 49

Factors of 56: 1, 2, 4, 7, 8, 14, 28, 56

Common factors of 49 and 56: 1, 7

∴ HCF of 49 and 56 = 7

Practice Set 24 | Q 1.05 | Page 47
Find the HCF of the following number.
120, 144

SOLUTION

Factors of 120: 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60, 120

Factors of 144: 1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72, 144

Common factors of 120 and 144: 1, 2, 3, 4, 6, 8, 12, 24

∴ HCF of 120 and 144 = 24

Practice Set 24 | Q 1.06 | Page 47
Find the HCF of the following number.
81, 99

SOLUTION

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

Factors of 99: 1, 3, 9, 11, 33, 99

Common factors of 81 and 99: 1, 3, 9

∴ HCF of 81 and 99 = 9

Practice Set 24 | Q 1.07 | Page 47
Find the HCF of the following number.
24, 36

SOLUTION

Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24

Factors of 36: 1, 2, 3, 4, 6, 9, 12, 18, 36

Common factors of 24 and 36: 1, 2, 3, 4, 6, 12

∴ HCF of 24 and 36 = 12

Practice Set 24 | Q 1.08 | Page 47
Find the HCF of the following number.
25, 75

SOLUTION

Factors of 25: 1, 5, 25

Factors of 75: 1, 3, 5, 15, 25, 75

Common factors of 25 and 75: 1, 5, 25

∴ HCF of 25 and 75 = 25

Practice Set 24 | Q 1.09 | Page 47
Find the HCF of the following number.
48, 54

SOLUTION

Factors of 48: 1, 2, 3, 4, 6, 8, 12, 16, 24, 48

Factors of 54: 1, 2, 3, 6, 9, 18, 27, 54

Common factors of 48 and 54: 1, 2, 3, 6

∴ HCF of 48 and 54 = 6

Practice Set 24 | Q 1.10 | Page 47
Find the HCF of the following number.
150, 225

SOLUTION

Factors of 150: 1, 2, 3, 5, 6, 10, 15, 25, 30, 50, 75, 150

Factors of 225: 1, 3, 5, 9, 15, 25, 45, 75, 225

Common factors of 150 and 225: 1, 3, 5, 15, 25, 75

∴ HCF of 150 and 225 = 75

Practice Set 24 | Q 2 | Page 47
If large square beds of equal size are to be made for planting vegetables on a plot of land 18 meters long and 15 meters wide, what is the maximum possible length of each bed?

SOLUTION

Length of the plot = 18 m

Breadth of the plot = 15 m

The maximum possible length of each square bed is the HCF of 18 m and 15 m.

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

Factors of 15 = 1, 3, 5, 15

Common factors of 18 and 15 = 1, 3

HCF of 18 and 15 = 3

∴ Maximum possible length of each square bed = 3 m

Thus, the maximum possible length of each square bed is 3 m.

Practice Set 24 | Q 3 | Page 47

Two ropes, one 8 meters long and the other 12 meters long are to be cut into pieces of the same length. What will the maximum possible length of each piece be?

SOLUTION

Length of one rope = 8 m

Length of other rope = 12 m

The maximum possible length of each piece of rope of the same length that can be cut from the two given ropes is the HCF of 8 m and 12 m.

Factors of 8: 1, 2, 4, 8

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

Common factors of 8 and 12: 1, 2, 4

HCF of 8 and 12 = 4

∴ Maximum possible length of each piece of rope of same length = 4 m

Thus, the maximum possible length of each piece of rope is 4 m.

Practice Set 24 | Q 4 | Page 47

The number of students of Std 6th and Std 7th who went to visit the Tadoba Tiger Project at Chandrapur was 140 and 196 respectively. The students of each class are to be divided into groups of the same number of students. Each group can have a paid guide. What is the maximum number of students there can be in each group ? Why do you think each group should have the maximum possible number of students?

SOLUTION

Number of students of Std 6th = 140

Number of students of Std 7th = 196

The maximum same number of students of each class that can be divided into each group is the HCF of 140 and 196.

Factors of 140: 1, 2, 4, 5, 7, 10, 14, 20, 28, 35, 70, 140

Factors of 196: 1, 2, 4, 7, 14, 28, 49, 98, 196

Common factors of 140 and 196: 1, 2, 4, 7, 14, 28

HCF of 140 and 196 = 28

∴ Maximum same number of students of each class that can be divided into each group = 28

Thus, the maximum number of students that can be in each group is 28.

Each group should have the maximum possible number of students so as to minimize the total amount paid to the guides.

Practice Set 24 | Q 5 | Page 47

At the Rice Research Centre at Tumsar, there are 2610 kg of seeds of the basmati variety and 1980 kg of the Indrayani variety. If the maximum possible weight of seeds has to be filled to make bags of equal weight what should be the weight of each bag? How many bags of each variety will there be?

SOLUTION

Weight of the seeds of basmati rice = 2610 kg

Weight of the seeds of Indrayani rice = 1980 kg

The maximum possible weight of each bag that can be filled with seeds of each variety of rice is the HCF of 2610 and 1980 in kilogram.

Factors of 2610:

1, 2, 3, 5, 6, 9, 10, 15, 18, 29, 30, 45, 58, 87, 90, 145, 174, 261, 290, 435, 522, 870, 1305, 2610

Factors of 1980:

1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 15, 18, 20, 22, 30, 33, 36, 44, 45, 55, 60, 66, 90, 99, 110, 132, 165, 180, 198, 220, 330, 396, 495, 660, 990, 1980

Common factors of 2610 and 1980: 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90

HCF of 2610 and 1980 = 90

∴ Maximum possible weight of each bag that can be filled with seeds of each variety of rice = 90 kg

Thus, the maximum weigth of each bag should be 90 kg.

Also,

$$\text{Number of bags filled with the seeds of basmati rice} = \frac{2610}{90} = 29$$

$$\text{Number of bags filled with the seeds of Indrayani rice} = \frac{1980}{90} = 22$$

Thus, the number of bags filled with the seeds of basmati rice and Indrayani rice are 29 and 22, respectively.

PRACTICE SET 25 [PAGE 50]

Practice Set 25 | Q 1.1 | Page 50
Find out the LCM of the following number: 9, 15

SOLUTION

Multiples of 9: 9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99,...

Multiples of 15: 15, 30, 45, 60,75, 90,...

Common multiples of 9 and 15: 45, 90,...

∴ LCM of 9 and 15 = 45

Practice Set 25 | Q 1.2 | Page 50
Find out the LCM of the following number: 2, 3, 5

SOLUTION

Multiples of 2: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30,...

Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36,...

Multiples of 5: 5, 10, 15, 20, 25, 30, 35,...

Common multiples of 2, 3 and 5: 30, 60, 90,...

∴ LCM of 2, 3 and 5 = 30

Practice Set 25 | Q 1.3 | Page 50
Find out the LCM of the following number: 12, 28

SOLUTION

Multiples of 12: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120,...

Multiples of 28: 28, 56, 84, 112,...

Common multiples of 12 and 28: 84, 168,...

∴ LCM of 12 and 28 = 84

Practice Set 25 | Q 1.4 | Page 50
Find out the LCM of the following number: 15, 20

SOLUTION

Multiples of 15: 15, 30, 44, 60, 75, 90, 105, 120,...

Multiples of 20: 20, 40, 60, 80, 100, 120,...

Common multiples of 15 and 20: 60, 120,...

∴ LCM of 15 and 20 = 60

Practice Set 25 | Q 1.5 | Page 50
Find out the LCM of the following number: 8, 11

SOLUTION

Multiples of 8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96,...

Multiples of 11: 11, 22, 33, 44, 55, 66, 77, 88, 99,...

Common multiples of 8 and 11: 88, 176,...

∴ LCM of 8 and 11 = 88

Practice Set 25 | Q 2.1 | Page 50
Solve the following problem.
On the playground, if the children are made to stand for drill either 20 to a row or 25 to a row, all rows are complete and no child is left out. What is the lowest possible number of children in that school?

SOLUTION

If the children are to stand in rows such that all rows are complete and no children is left out, then the number of children in the school must be in multiples of both 20 and 25.
So, the lowest possible number of children in the school is the LCM of 20 and 25.

Multiples of 20: 20, 40, 60, 80, 100, 120, 140, 160, 180, 200,...

Multiples of 25: 25, 50, 75, 100, 125, 150, 175, 200,...

Common multiples of 20 and 25: 100, 200,...

∴ Lowest of possible number of children in that school = LCM of 20 and 25 = 100

Thus, the lowest of possible number of children in that school is 100.

Practice Set 25 | Q 2.2 | Page 50

Veena has some beads. She wants to make necklaces with an equal number of beads in each. If she makes necklaces of 16 or 24 or 40 beads, there is no bead left over. What is the least number of beads with her?

SOLUTION

Veena wants to make necklaces with an equal number of beads in each such there is no bead left over, so the number of beads with her must be in multiples of 16, 24, and 40. Therefore, the least number of beads with her is the LCM of 16, 24, and 40.

Multiples of 16: 16, 32, 48, 64, 80, 96, 112, 128, 144, 160, 176, 192, 208, 224, 240, 256,...

Multiples of 24: 24, 48, 72, 96, 120, 144, 168, 192, 216, 240, 264,...

Multiples of 40: 40, 80, 120, 160, 200, 240, 280,...

Common multiples of 16, 24, and 40: 240, 480,...

∴ Least number of beads with Veena = LCM of 16, 24 and 40 = 240

Thus, the least number of beads with Veena is 240.

Practice Set 25 | Q 2.3 | Page 50

An equal number of laddoos have been placed in 3 different boxes. The laddoos in the first box were distributed among 20 children equally, the laddoos in the second box among 24 children, and those in the third box among 12 children. Not a single laddoo was leftover. Then, what was the minimum number of laddoos in the three boxes altogether?

SOLUTION

The lowest common multiple of 20,24 and 12 gives the minimum number of laddoos in one box.
Multiples of 20 = 20, 40, 60, 80, 100,120, 140, 160, 180, 200
Multiples of 24 = 24, 48, 72, 96, 120
Multiples of 12 = 12, 24, 36, 48, 60, 72, 84, 96, 108, 120
∴ LCM of 20, 24 and 12 = 120
∴ Minimum number of ladoos in 1 boxes =120
∴ Minimum number of ladoos in 3 boxes = 3 x 120 = 360
∴ The minimum number of ladoos in 3 boxes are 360.

Practice Set 25 | Q 2.4 | Page 50

We observed the traffic lights at three different squares on the same big road. They turn green every 60 seconds, 120 seconds and 24 seconds. When the signals were switched on at 8 o'clock in the morning, all the lights were green. How long after that will all three signals turn green simultaneously again?

SOLUTION

All the three signals would turn green simultaneously again at a time which is a multiple of the three intervals of 60 seconds, 120 seconds, and 24 seconds. So, all three signals turn green simultaneously again after a time interval which is the LCM of 60 seconds, 120 seconds, and 24 seconds.

Multiples of 60: 60, 120, 180, 240,...

Multiples of 120: 120, 240,...

Multiples of 24: 24, 48, 72, 96, 120, 144, 168,...

Common multiples of 60, 120, and 24: 120, 240,...

∴ All the three signals turn green simultaneously again = LCM of the time intervals 60 seconds, 120 seconds and 24 seconds = 120 seconds

Thus, all three signals turn green simultaneously again after 120 seconds.

Practice Set 25 | Q 2.5 | Page 50

Given the fractions 13/45 and 22/75. Write their equivalent fractions with the same denominators and add the fractions.

SOLUTION

The given fractions are $\frac{13}{45}$ and $\frac{22}{75}$

Multiples of 45: 45, 90, 135, 180, 225, 270,...

Multiples of 75: 75, 150, 225,...

Common multiples of 45 and 75: 225, 450,...

$\therefore$ LCM of 45 and 75 = 225

Equivalent fraction of $\frac{13}{45} = \frac{13 \times 5}{45 \times 5} = \frac{65}{225}$ (225 ÷ 45 = 5)

Equivalent fraction of $\frac{22}{75} = \frac{22 \times 3}{75 \times 3} = \frac{66}{225}$ (225 ÷ 75 = 3)

Also,

$$\frac{13}{45} + \frac{22}{75}$$
$$= \frac{65}{225} + \frac{66}{225}$$
$$= \frac{65 + 66}{225}$$
$$= \frac{131}{225}$$