



Let's recall.

## Divisor, Dividend

In the empty boxes, write the proper words : dividend, divisor, quotient, remainder.

$$\begin{array}{r} \boxed{\phantom{00}} \leftarrow 9 \rightarrow \boxed{\phantom{00}} \\ \boxed{\phantom{00}} \leftarrow 4 \overline{)36} \rightarrow \boxed{\phantom{00}} \\ \underline{36} \\ 00 \rightarrow \boxed{\phantom{00}} \end{array}$$

$$\begin{array}{r} \boxed{\phantom{00}} \leftarrow 7 \rightarrow \boxed{\phantom{00}} \\ \boxed{\phantom{00}} \leftarrow 9 \overline{)65} \rightarrow \boxed{\phantom{00}} \\ \underline{63} \\ 02 \rightarrow \boxed{\phantom{00}} \end{array}$$

When we divide 36 by 4, the remainder is zero. Therefore, 4 is a **factor** of 36 and 36 is a **multiple** of 4. (36 is divisible by 4.)

When we divide 65 by 9, the remainder is not zero. Therefore, 9 is not a **factor** of 65. Also, 65 is not a **multiple** of 9. (65 is not divisible by 9.)

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

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

Write the common factors.  $\boxed{\phantom{00}}$ ,  $\boxed{\phantom{00}}$ ,  $\boxed{\phantom{00}}$ ,  $\boxed{\phantom{00}}$ ,  $\boxed{\phantom{00}}$ ,  $\boxed{\phantom{00}}$

## Practice Set 23

\* Write all the factors of the given numbers and list their common factors.

- (1) 12, 16      (2) 21, 24      (3) 25, 30      (4) 24, 25      (5) 56, 72



Let's learn.

## Highest Common Factor : HCF

**Example :** My aunt has brought two ribbons of different colours, one 12 metres long and the other 18 metres. Both the ribbons have to be cut into pieces of the same length. What should be the maximum length of each piece?



The number which gives the length of each piece must be a factor of 12 and of 18.

Factors of 12 : 1, 2, 3, 4,  $\boxed{6}$ , 12

Factors of 18 : 1, 2, 3,  $\boxed{6}$ , 9, 18

Of the common factors of 12 and 18, 6 is the greatest. Therefore, the maximum length of each piece should be 6 metres.

**Example :** There are 20 kg of jowar and 50 kg of wheat in a shop. All the grain is to be packed in bags. If all the bags are to have equal weights of grain, what is the maximum weight of grain that can be filled in each bag ?

The weight of the grain in each bag must be a factor of 20 and 50. Besides, the maximum possible weight must be filled in each bag. Hence, let us find the HCF of 20 and 50.

Factors of 20 : 1, 2, 4, 5, 10, 20

Factors of 50 : 1, 2, 5, 10, 25, 50

Common factors : 1, 2, 5, 10

Of the common factors of 20 and 50, 10 is the greatest, i.e. 10 is the HCF of the numbers 20 and 50.

Therefore, a maximum of 10 kg of grain can be filled in each bag.



**Now I know –**

**To find the HCF of given numbers, we make a list of the factors of the numbers and find the greatest of the common factors.**

### Practice Set 24

- Find the HCF of the following numbers.  
(1) 45, 30      (2) 16, 48      (3) 39, 25      (4) 49, 56      (5) 120, 144  
(6) 81, 99      (7) 24, 36      (8) 25, 75      (9) 48, 54      (10) 150, 225
- If large square beds of equal size are to be made for planting vegetables on a plot of land 18 metres long and 15 metres wide, what is the maximum possible length of each bed ?
- Two ropes, one 8 metres long and the other 12 metres long are to be cut into pieces of the same length. What will the maximum possible length of each piece be ?
- 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 ?
- 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 ?



Let's learn.

### Lowest Common Multiple : LCM

Write down the 3 times and 4 times tables. Note that a table has the multiples of a number arranged in serial order. Which is the smallest number divisible by both 3 and 4? We find the lowest common multiple or the LCM useful for certain purposes in daily life. Can you find the greatest common multiple of some given numbers? Think about it.

Rehana and Anne are making garlands of flowers. Both have to be given an equal number of flowers in their baskets.

**Tai** : Rehana, you make garlands of 6 flowers each. Anne, you make garlands of 8 flowers each. What is the minimum number of flowers I should put in your baskets?

**Rehana** : I want flowers in multiples of 6.

**Anne** : I want them in multiples of 8.

Multiples of 6 are numbers that are

divisible by 6 and they are 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, ...

Multiples of 8 are numbers that are divisible by 8 and they are 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, ...

The common multiples are 24, 48, 72, 96, ...

**Rehana** : Tai, if you give each of us 24, 48, 72 or 96 flowers, we will both be able to make the garlands as you want.

**Anne** : You will have to give us at least 24 flowers.

24 is the lowest common multiple or LCM of 6 and 8.

**Example** : Find the LCM of 13 and 6.

13 times table : 13, 26, 39, 52, 65, 78, 91, 104, 117, 130

6 times table : 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

Here, we see no common multiples. So, let us extend the tables.

Further numbers divisible by 13 : 130, 143, 156, ...

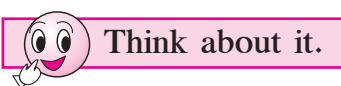
Further numbers divisible by 6 : 60, 66, 72, 78, 84, ...

Looking at the lists of numbers divisible by 13 and 6, we see that 78 is the lowest common multiple. Therefore, the LCM of 13 and 6 is 78.



Now I know -

The LCM of two numbers cannot be bigger than their product.



Think about it.



**Example :** Pravin, Bageshri and Yash are cousins who live in the same house. Pravin is an Army Officer. Bageshri is studying in a Medical College in another city. Yash lives in a nearby town in a hostel. Pravin can come home every 120 days. Bageshri comes home every 45 days and Yash, every 30 days. All three of them left home at the same time on the 15th of June 2016. Their parents said, “We shall celebrate like a festival the day you all come home together.” Mother asked Yash, “What day will that be?”

Yash said, “The number of days after which we come back together must be divisible by 30, 45 and 120. That means we shall be back together on the 10th of June next year. That will certainly be a festival for us!”

How did Yash find the answer?



Now I know –

To find the LCM of the given numbers, we write down the multiples of each of the given numbers and find the lowest of their common multiples.

### Practice Set 25

1. Find out the LCM of the following numbers.  
(1) 9, 15              (2) 2, 3, 5              (3) 12, 28              (4) 15, 20              (5) 8, 11
2. Solve the following problems.
  - (1) 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?
  - (2) 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?
  - (3) 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 left over. Then, what was the minimum number of laddoos in the three boxes altogether?
  - (4) 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?
  - (5) Given the fractions  $\frac{13}{45}$  and  $\frac{22}{75}$  write their equivalent fractions with same denominators and add the fractions.



### A Maths Riddle!

We have four papers. On each of them there is a number on one side and some information on the other. The numbers on the papers are 7, 2, 15, 5. The information on the papers is given below in random order.

(I) A number divisible by 7.

(II) A prime number

(III) An odd number

(IV) A number greater than 100

If the number on every paper is mismatched with the information on its other side, what is the number on the paper which says 'A number greater than 100'?

