LESSON - 4

MULTIPLES AND FACTORS

K6H3L5

Sunu, Munu and Gunu were playing marbles. Let us make divisions (units) of all the 12 marbles they have in different ways.

Sunu made 12 divisions with 1 marble per division.

12 divisions with 1 marble per division– 1×12

Munu made 6 divisions with 2 marbles per division–

6 divisions with 2 marbles per division. 2×6

Again, Gunu made divisions in this manner–

4 divisions with 3 marbles per division. 3×4

Following Munu and Gunu, Sunu again arranged the marbles in the following manner–

3 divisions with 4 marbles per division. 4×3

Looking at Sunu, Munu again arranged them in another way –

2 divisions with 6 marbles per division. 6×2

Finally, Gunu collected all the marbles together to form a single division.

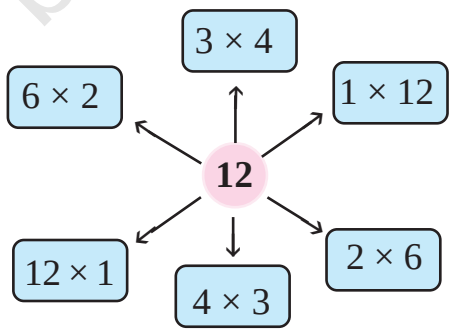
1 division with all 12 marbles in it.

12×1

What do we learn from the arrangements of Sunu, Munu and Gunu? Let us see–

$1 \times 12 = 12$
$2 \times 6 = 12$
$3 \times 4 = 12$
$4 \times 3 = 12$
$6 \times 2 = 12$
$12 \times 1 = 12$

Now carefully observe at the pairs of numbers multiplied together to get 12–



What do you learn from it?

Multiplying 1 and 12 or, 2 and 6 or, 3 and 4 we get 12. Therefore, the numbers 1,2,3,4,6, and 12 are factors of 12.

What do we mean by factors? Let us see–

If a given number is expressed as the product of some other numbers then these numbers are called the **factor**s of the given number.

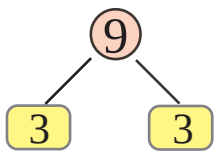
or,

The numbers forming a particular product are called **factor**s of the product.

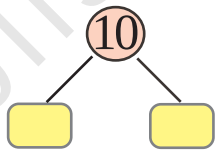
Factor tree –

Let us make trees with factors of numbers-

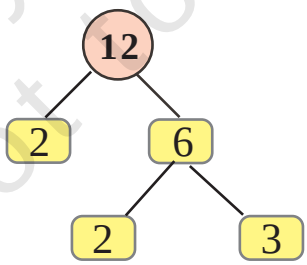
i) Factor tree of 9



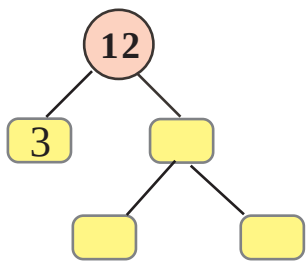
ii) Factor tree of 10 (try yourself)



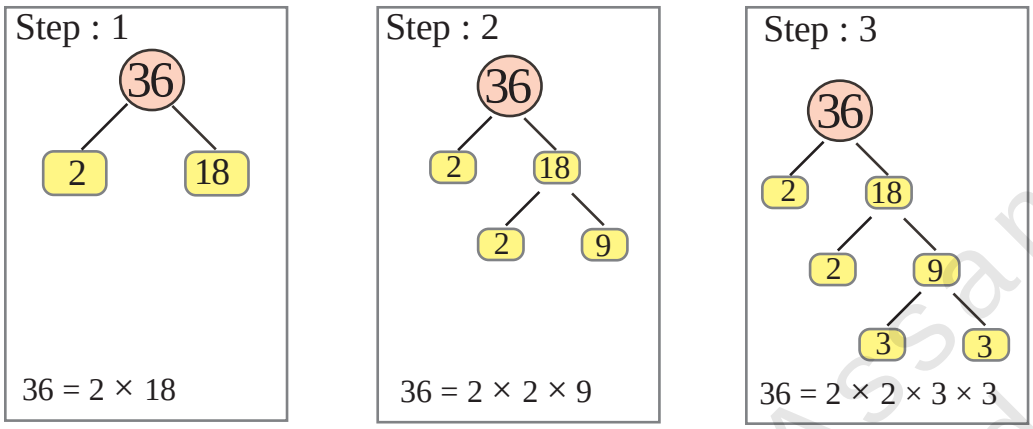
iii) Factor tree of 12



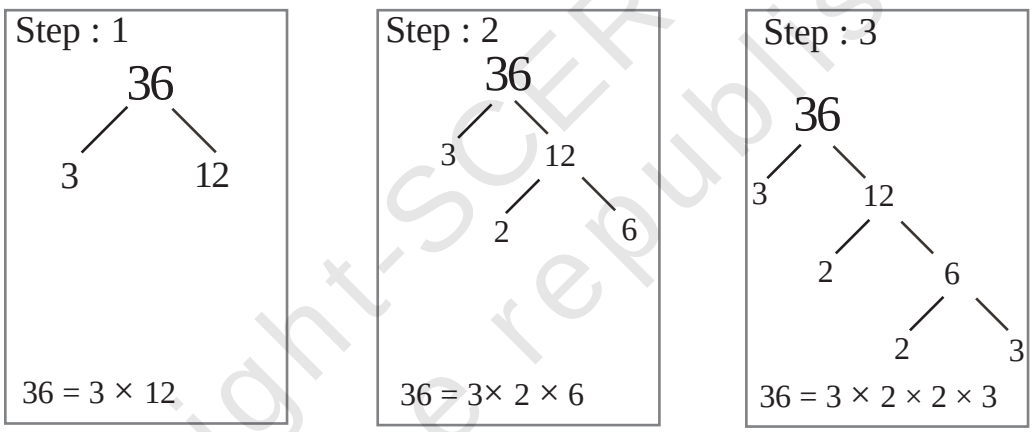
iv) Another factor tree of 12 (make yourself)



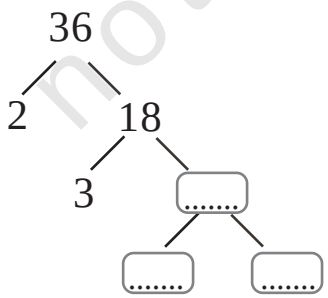
(v) Let us make factor trees of 36–



(vi) Let us make another factor tree of 36–



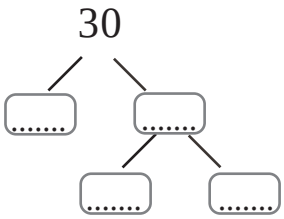
(vii) Note another factor tree of 36 and fill in the gaps–



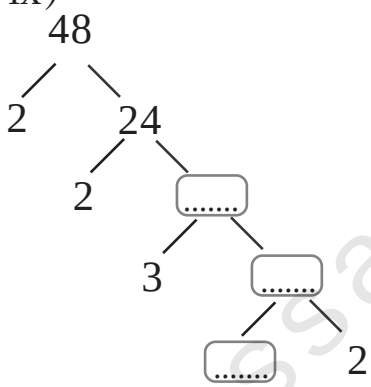
What do we learn?
There may be more than one factor tree of a number.

Try yourself :

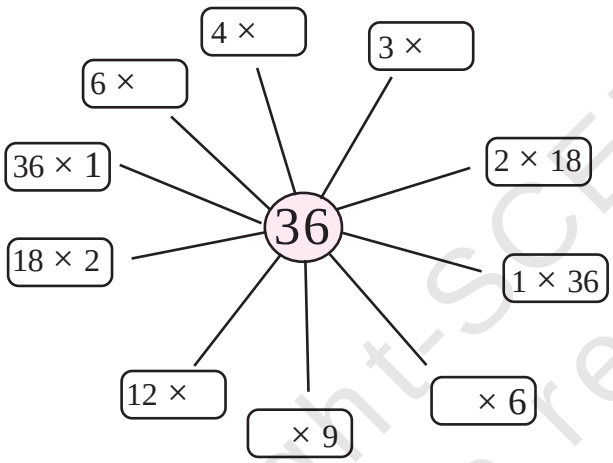
viii)



ix)

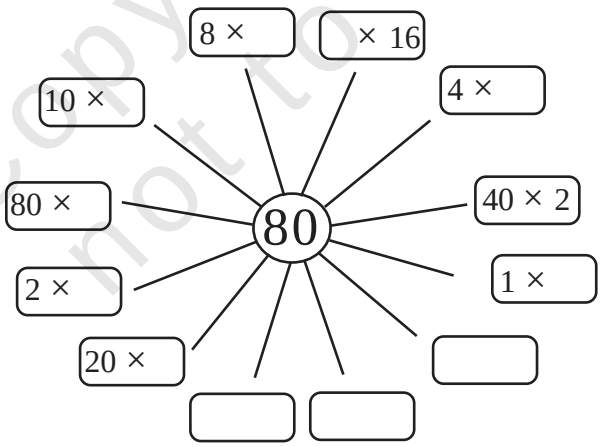


Let us complete the following factor cycle –



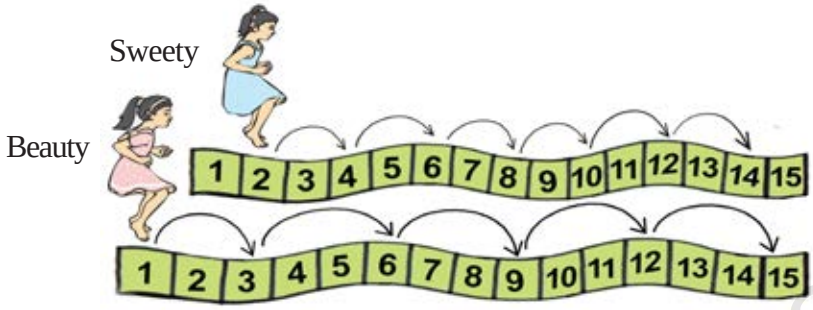
From the factor cycle, write down the factors of 36.

Factor cycle of 80–



From the factor cycle write down the factors of 80.

Activity : Let us look at the jumps of Sweety and Beauty–



Sweety is standing on the number 2. She is asked to jump at every alternete step. Note down the numbers Sweety has reached while jumping successively from one to another. Observe the numbers at Sweety's jumps and write down all of them. The numbers are–

2, 4, ——, ——, ——, ——, ——, ——, ——

The numbers reached by Beauty's jumps are-

3, 6, ——, ——, ——, ——, ——, ——, ——

Note that : The numbers 2, 4, 6, 8, 10 etc can be found successively multiplying 2 by 1,2,3,... etc.

i.e., $2 \times 1 = 2$
$2 \times 2 = 4$
$2 \times 3 = 6$
} Therefore, 2, 4, 6, ... etc. are **multiples of 2**.

..... etc.

In a similar way, 3, 6, 9, 12 etc. are obtained by multiplying 3 successively by 1, 2, 3, ... etc. Isn't it?

i.e., $3 \times 1 = 3$
$3 \times 2 = 6$
$3 \times 3 = 9$
} So, 3, 6, 9, 12, ... etc. are **multiples of 3**.

..... etc.

Write down any 5 multiples of the following numbers :

Multiples of 4 : ☐ ☐ ☐ ☐ ☐

Multiples of 5 : ☐ ☐ ☐ ☐ ☐

Multiples of 6 : ☐ ☐ ☐ ☐ ☐

Multiples of 10 : ☐ ☐ ☐ ☐ ☐

Activity :

Look at the following table and answer the questions–

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

(a) Colour all positions that are multiples of 4 with green.

(b) Colour all positions that are multiples of 6 with red.

(c) Colour all positions that are multiples of 10 with yellow.

(d) Which positions are coloured with both green and red? Write down the numbers.

These numbers are **common multiples of 4 and 6**.

(e) Write down the common multiples of 4 and 5.

(f) What is the **least** of the **common multiple** of 4 and 5?.....

Discuss within the team :

Tinku and Rinku are playing in a field. They decided to run around the field. To make a complete round of the field Tinku takes 8 minutes while Rinku takes 12 minutes. Each time Tinku completes a round of the field a bell rings. Similarly, each time Rinku completes a round of the field a whistle blows. Both started running simultaneously. After how many minutes, will the bell and the whistle blow together? Think over the answer.

Let us find the relations between factors and multiples –

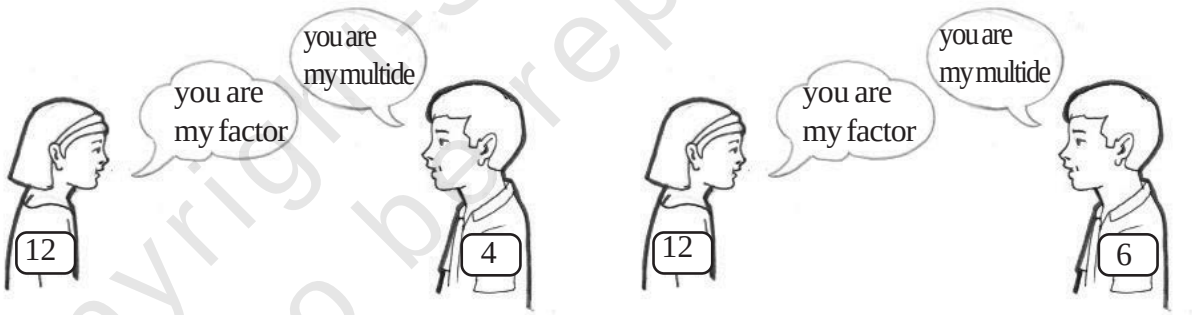
You could see that the numbers 1, 2, 3,4,6, and 12 are factors of 12.

That is, $12 = 3 \times 4$

or

$12 = 6 \times 2$

Factors of 12 are 3 and 4 as well as 6 and 2. On the other hand, the multiple of 3 and 4 is 12 the multiple of 2 and 6 is also 12



Let us remember (The teacher will explain the following points)

- The numbers forming a certain product are factors of the product.
- Another term for factor is divisor
- 1 is a factor of all numbers
- Every number is a factor of itself
- Every number has innumerable multiples
- A number is the greatest factor of itself and also its least multiple.

****