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1. The hungry cat is trying to catch Kunjan the mouse. Kunjan is now on the 14th step and it can jump 2 steps at a time. The cat is on the third step. She can jump 3 steps at a time. If the mouse reaches 28 it can hide in the hole. Find out whether the mouse can get away safely.

a) The steps on which the mouse jumps

Solution:-

The mouse jumps from 14^{th} step to 16, 18, 20, 22, 24, 26, and 28^{th} step.

b) The steps on which the cat jumps

Solution:-

The cat jumps from 3^{rd} step to 6, 9, 12, 15, 18, 21, 24, and 27^{th} step.

c) The steps on which both the cat and the mouse jump

Solution:-

The steps on which both the cat and the mouse jump are 18^{th} and 24^{th} step.

d) Can the mouse get away?

Solution:-

Yes, the mouse get away.

2. Find out

If the cat starts from the 5^{th} step and jumps five steps at a time and the mouse starts from the 8^{th} step and jumps four steps at a time, can the mouse get away?

Solution:-

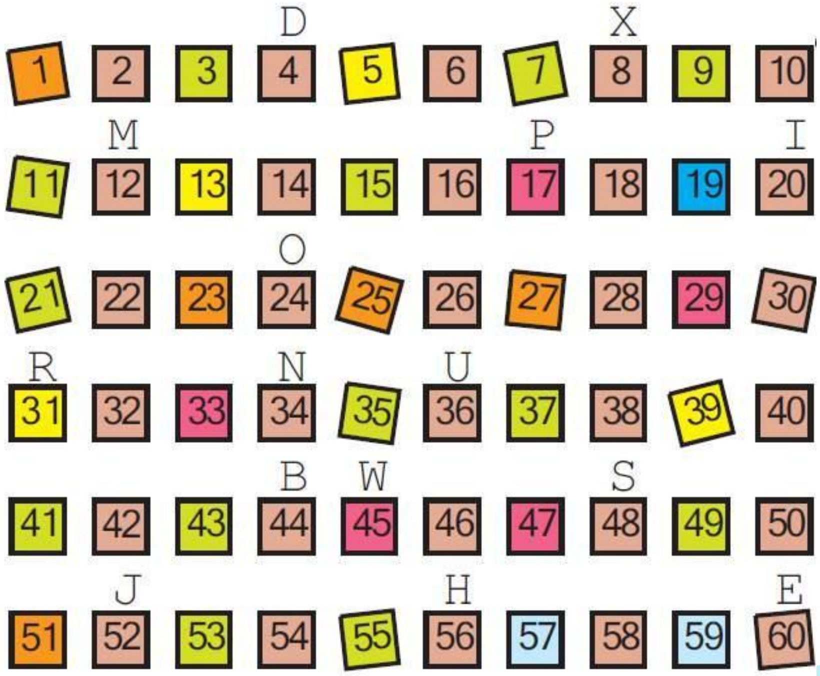
If the cat starts from the 5^{th} step and jumps five steps at a time, the cat jumps from 5^{th} step to 10, 15, 20, and 25^{th} step.

Then, the mouse starts from the 8^{th} step and jumps four steps at a time, the mouse jumps from 8^{th} step to 12, 16, 20, and 24^{th} step.

No, mouse cannot get away. Cat will easily catch the mouse at 20^{th} step.

3. Who is Monto waiting for?

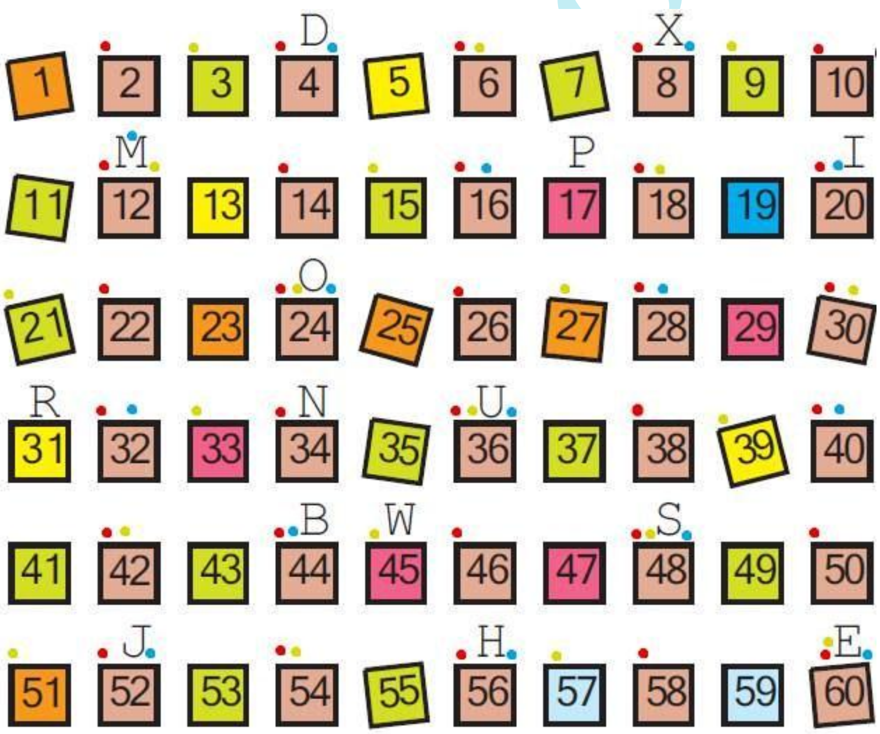
Monto cat is waiting for somebody. Do you know for whom he is waiting? There is a trick to find out.



Mark with a red dot all the numbers which can be divided by 2.

Mark a yellow dot on the numbers which can be divided by 3 and a blue dot on the numbers which can be divided by 4.

Solution:-



(i) Which are the boxes which have dots of all three colours?

Solution:-

The boxes which have dots of all three colours are 12, 24, 36, 48, and 60.

(ii) What are the letters on top of those boxes?

Solution:-

The letters on top of those boxes are M, O, U, S, E.

(iii) Write those letters below in order.

Solution:-

MOUSE,

So, Monto cat is waiting for Mouse.

4. Meow Game, to play this game, everyone stands in a circle. One player calls out 'one'. The next player says 'two' and so on. A player who has to call out 3 or a number which can be divided by 3 has to say 'Meow' instead of the number. One who forgets to say 'Meow' is out of the game. The last player left is the winner.

Which numbers did you replace with 'Meow'?

Solution:-

The numbers which replace with 'Meow' are and multiples of 3 are, 3,
6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45 and so on.

5. We say these numbers are the multiples of 3.

Play the game by changing the number to 4. Now, which numbers did you replace with 'Meow'? These numbers are the multiples of 4.

Solution:-

The numbers which replace with 'Meow' and multiples of 4 are, 4,
8, 12, 16, 20, 24, 28, 32, 36, 40, and so on.

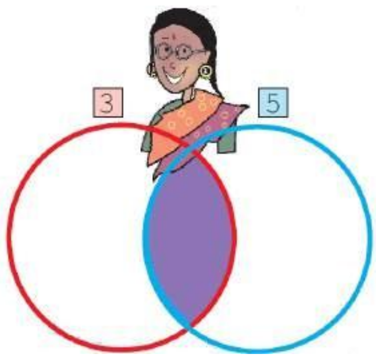
(i) Write any ten multiples of 5

Solution:-

Ten multiples of 5 are, 5, 10, 15, 20, 25, 30, 35, 40, 45, and 50.

6. Common Multiples

(i) Think of a number. If it is a multiple of 3 write it in the red circle. If it is a multiple of 5 write it in the blue circle.

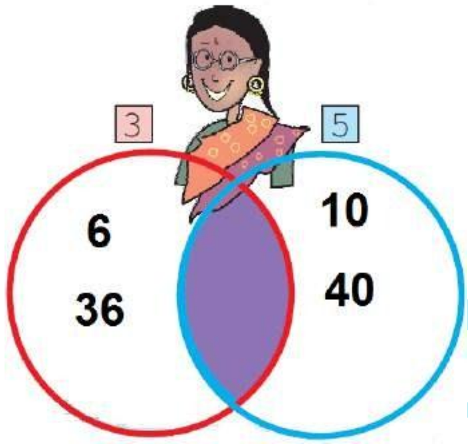


Solution:-

6 and 36 are multiple of 3.

10 and 40 are multiple of 5.

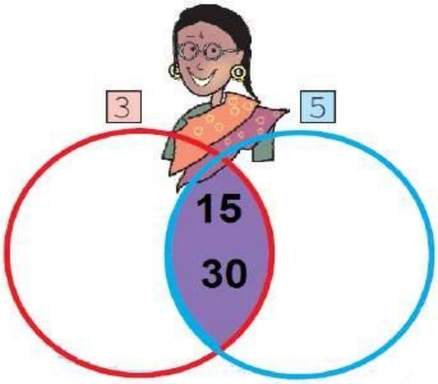
Then,



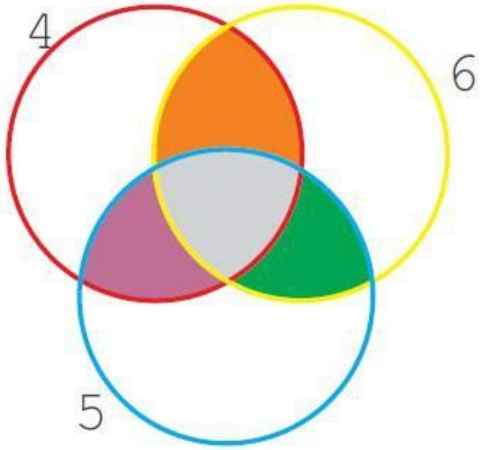
(ii) Some numbers are multiples of both 3 and 5. So we can say that they are to both 3 and 5. Think! If you write the multiples common to 3 and 5 in the purple part, then will they still be in both the red and the blue circles?

Solution:-

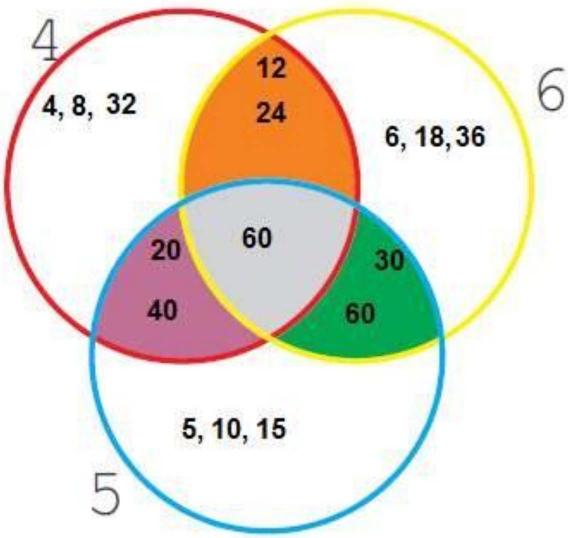
15 and 30 are the numbers which are multiples of both 3 and 5.



7. Repeat the game by putting the multiples of 4, 6 and 5 in the circles.



Solution:-



(i) What common multiples of 5 and 6 did you write in the green part?
Solution:-
30 and 60 are the common multiples of 5 and 6.

(ii) What common multiples of 4 and 6 are written in the orange part?
Solution:-
12 and 24 are the common multiples of 4 and 6.

(iii) In which coloured part did you write the common multiples of 4, 6 and 5?
Solution:-
The common multiples of 4, 6 and 5 are written in the gray part.

(iv) What is the smallest common multiple of 4, 6 and 5?

Solution:-

The smallest common multiple of 4, 6 and 5 is 60.

8. Tamarind seeds.

(i) Sunita took some tamarind (imli) seeds. She made groups of five with them, and found that one seed was left over She tried making groups of six and groups of four. Each time one seed was left over. What is the smallest number of seeds that Sunita had?

Solution:-

From the question it is given that,

Sunita is trying to make groups of four, five, and six, every time one seed remains. So, now we calculate the LCM of 4, 5, 6 and add 1 to the LCM.

LCM of 4, 5, and 6 is 60

Adding 1 to the LCM we get, 61

Therefore, the smallest number of seeds that Sunita had is 61.

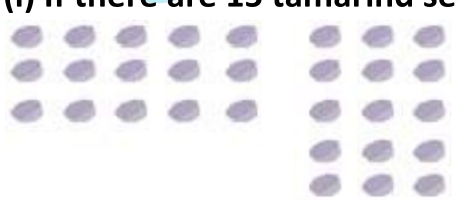
9. More tamarind seeds

Ammini is arranging 12 tamarind seeds in the form of different rectangles. Try to make more rectangles like this using 12 tamarind seeds. How many different rectangles can you make?

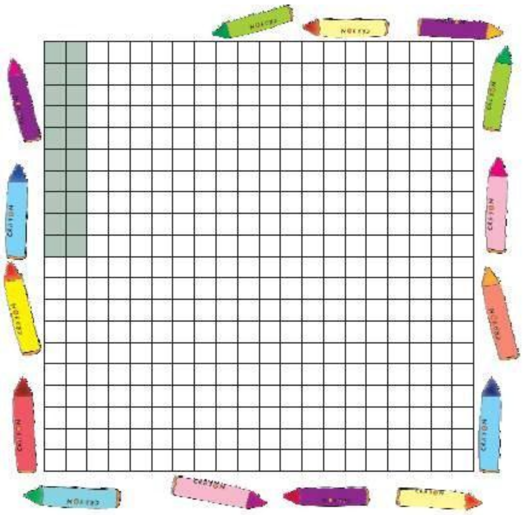
Solution:-

I got four different rectangles are as shown in the figure below,

(i) If there are 15 tamarind seeds how many rectangles can you make? Solution:-

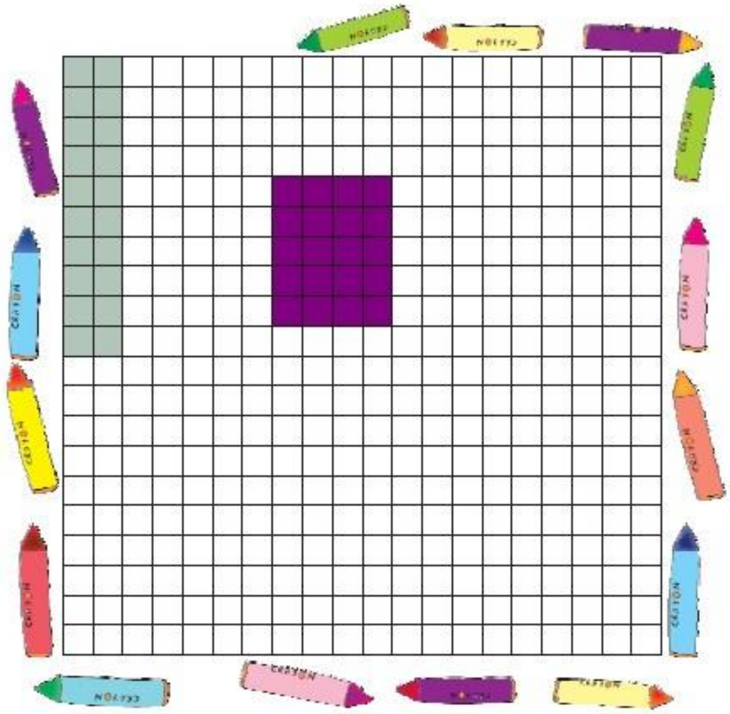


10. Colouring the Grid



In the grid here, a rectangle made of 20 boxes is drawn.
The width of this rectangle is 2 boxes.
(i) What is its length? Solution:-
By observing the recatngle coloured in the grid we can say that length of the rectangle is 10 boxes.

(ii) Colour a rectangle made of 20 boxes in some other way. Solution:-

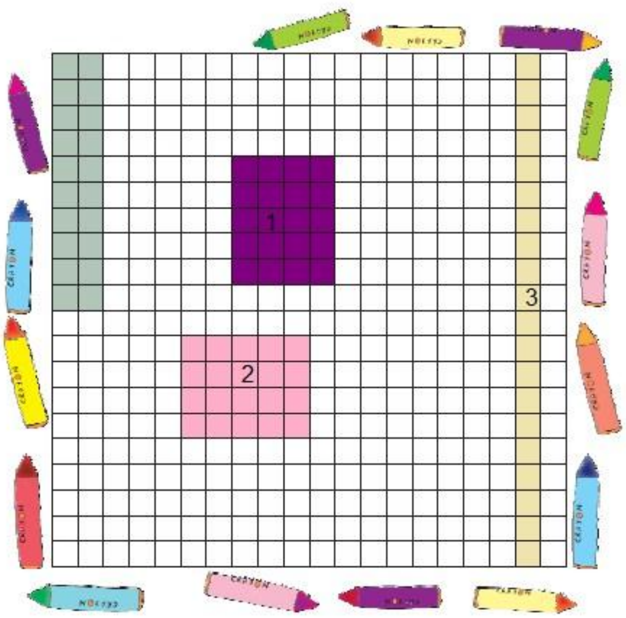


(iii) What is the length and width of the rectangle you coloured?

Solution:-

The length of the rectangle is 5 boxes and width of the reactangle is 4 boxes.

(iv) In how many ways can you colour a rectangle of 20 boxes? Colour them all in the grid, and write the length and width of each rectangle you have coloured. Solution:-



Length and widht of rectangle 1 is 5 and 4 respectively.

Length and widht of rectangle 2 is 4 and 5 respectively.

Length and widht of rectangle 3 is 20 and 1 respectively.

11. There are 18 bangles on the rod. Meena is trying to group them. She can put them in groups of 2, 3, 6, 9 and 18 — without any bangle being left.

(i) How many groups will she have if she makes groups of 1 bangle each?

Solution:-

If Meena makes groups of 1 bangle each, she will get 18 groups.

(ii) Now complete the table, for different numbers of bangles. For each number see what different groups can be made.

Number of bangles	Different groups we can make
18	1, 2, 3, 6, 9, 18
24	1, 2, ...
5	
9	
7	
2	
10	
1	
20	
13	
21	

Solution:-

Number of bangles	Different groups we can make
18	1, 2, 3, 6, 9, 18
24	1, 2, 3, 4, 6, 8, 12, 24
5	1, 5
9	1, 3, 9
7	1, 7
2	1, 2
10	1, 2, 5, 10
1	1
20	1, 2, 4, 5, 10, 20
13	1, 13
21	1, 3, 7, 21

12. Fill the chart

Complete the multiplication chart given here.

×	1	2	3	4	5	6	7	8	9	10	11	12
1												12
2						12						
3				12			21					
4			12							40		
5				20								
6		12										
7												
8									72			
9												
10												
11						66						
12	12											

Look at the green boxes in the chart. These show how we can get 12 by multiplying different numbers.

12 = 4 × 3, so 12 is a multiple of both 4 and 3. 12 is also a multiple of 6 and 2, as well as 12 and 1. We say 1, 2, 3, 4, 6, 12 are factor of 12

12
4×3
6×2
1×12

Solution:-

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

10
5×2

(i) What are the factors of 10? Can you do this from the chart?

Solution:-

From the chart factors of 10 are 1, 2, 5 and 10.

(ii) What are the factors of 36?

Solution:-

1, 2, 3, 4, 6, 9, 12, 18 and 36 are the factors of 36.

(iii) Find out all the factors of 36 from the multiplication chart.

Solution:-

From the multiplication chart the factors of 36 are 1, 2, 3, 4, 6, and 9.

(iv) What is the biggest number for which you can find the factors from this chart?

Solution:-

From the multiplication chart 144 is the biggest number for which we can find the factors.

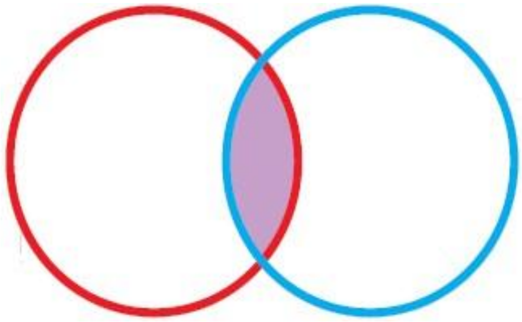
(v) What can you do for numbers bigger than that?

Solution:-

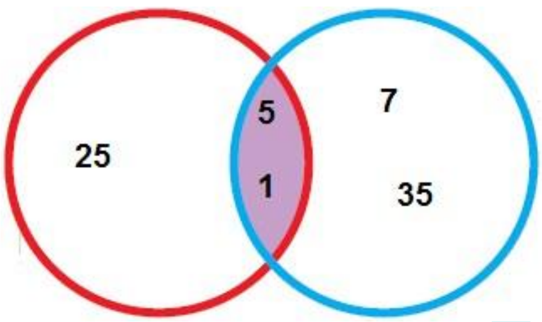
First, we will extend the multiplication chart and then complete the chart.

13. Common Factors

(i) Write the factors of 25 in the red circle and the factors of 35 in the blue circle.



Solution:-

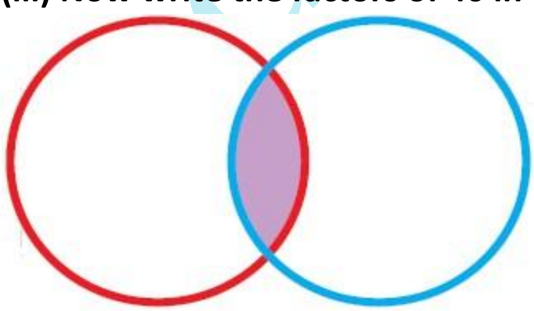


(ii) Which are the factors you have written in the common part (purple) of both circles? These are of 25 and 35.

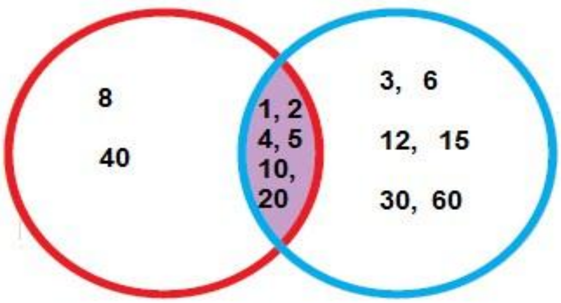
Solution:-

5 and 1 are the common factors of 25 and 35

(iii) Now write the factors of 40 in the red circle and 60 in the blue circle.



Solution:-



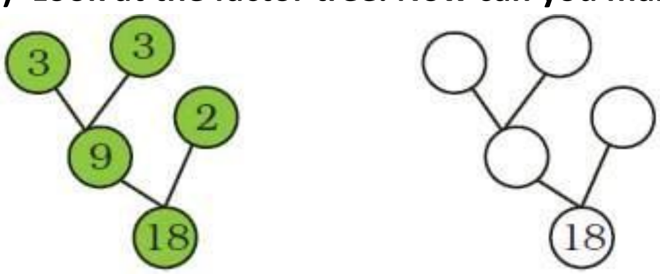
(iv) What are the factors written in the common (purple) part of the circle? Which is the biggest common factor of 40 and 60?

Solution:-

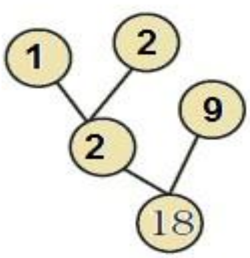
20 is the biggest common factor of 40 and 60.

14. Factor Tree

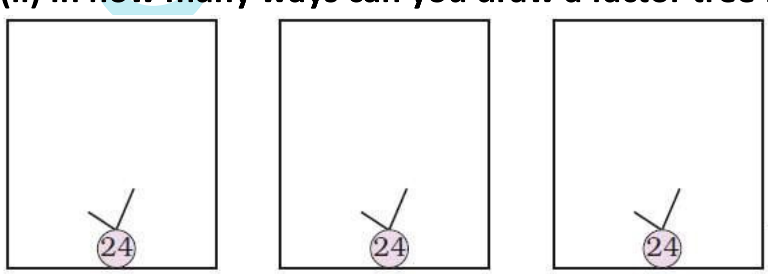
(i) Look at the factor tree. Now can you make another tree like this?



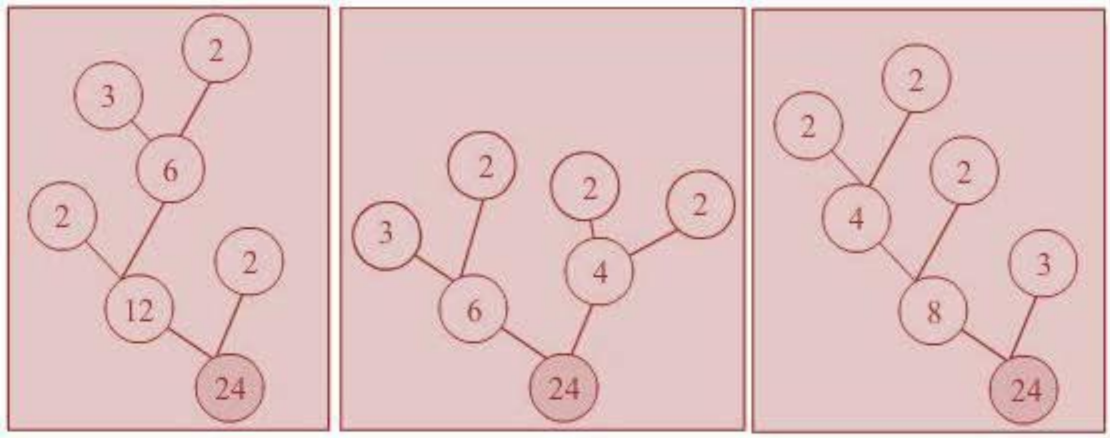
Solution:-



(ii) In how many ways can you draw a factor tree for 24? Draw three of them below.



Solution:-



15. Tiling Problems

(i) There is a garden in Anu's house. In the middle of the garden there is a path. They decided to tile the path using tiles of length 2 feet, 3 feet and 5 feet.
The mason tiled the first row with 2 feet tiles, the second row with 3 feet tiles and the third row with 5 feet tiles. The mason has not cut any of the tiles. Then what is the shortest length of the path?

Solution:-

From the question it is given that, mason tiled the first row with 2 feet tiles, the second row with 3 feet tiles and the third row with 5 feet tiles.
So, now we have to find the LCM of 2, 3 and 5.
The LCM of 2, 3, and 5 is 30.
Therefore, the shortest length of the path is 30 m.

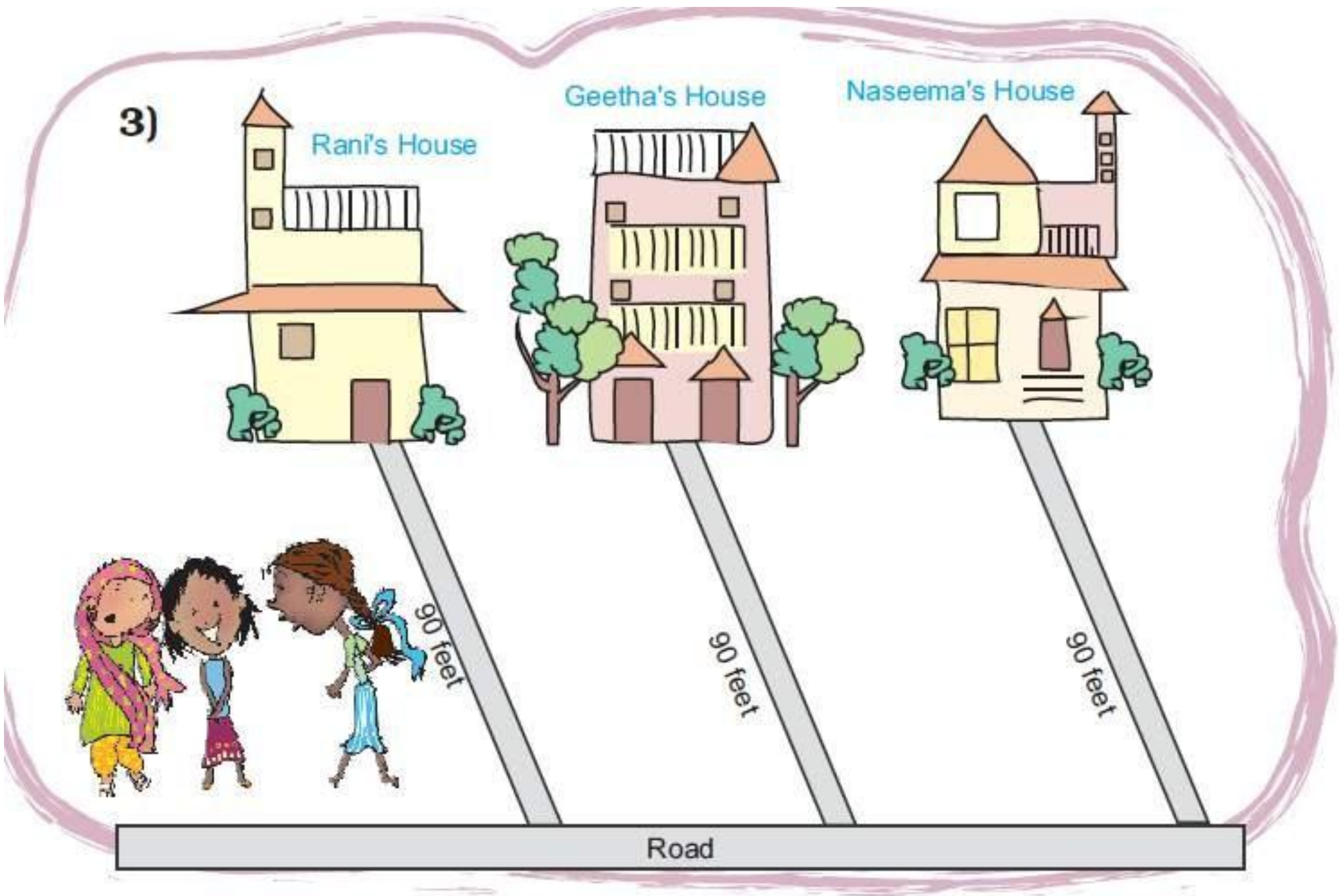
(ii) Manoj has a new house. He to lay tiles on the floor. The size of the room is 9 feet × 12 feet. In the market, there are three kinds of square tiles: 1 foot × 1 foot, 2 feet × 2 feet and 3 feet × 3 feet. Which size of tile should he buy for his room, so that he can lay it without cutting?

Solution:-

From the question it is given that, size of the room is 9 feet × 12 feet.
Size of the tiles available in the market are: 1 foot × 1 foot, 2 feet × 2 feet and 3 feet × 3 feet.
Here, 2 is not a factor of width of the room i.e. 9 feet, so 2 feet × 2 feet tiles is not able to lay.
1 and 3 are the factors of 3 and 9.

Therefore, Monoj can buy1 foot × 1 foot, and 3 feet × 3 feet, so that he can lay it without cutting.

(iii)



Rani, Geetha and Naseema live near each other. The distance from their house to the road is 90 feet. They decided to tile the path to road. They all bought tiles of different designs and length. Rani the shortest tile, Geetha bought the middle sized one and Naseema bought the longest one. If they could tile the path without cutting any of the tiles what the size of the tiles each has bought? Suggest 3 different solutions. Explain how you get this answer.

Solution:-

From the question, the distance from their house to the road is 90 feet.

Factors of 90 are, 1, 2, 3, 5, 6, 9 etc.

Then, possible size of tiles are 1 foot × 1 foot, 2 feet × 2 feet, 3 feet × 3 feet, 5 feet × 5 feet, 6 feet × 6 feet and 9 feet × 9 feet etc. Then the size of the tiles each has bought are,

(i) Rani 1 foot × 1 foot
Geetha 2 feet × 2 feet
Naseema 3 feet × 3 feet

(ii) Rani 2 foot × 2 foot
Geetha 3 feet × 3 feet
Naseema 5 feet × 5 feet

(iii) Rani 3 foot × 3 foot
Geetha 5 feet × 5 feet
Naseema 6 feet × 6 feet