

How to solve problems.



There are a total of 12 tricycles and bicycles in the kid's store. All have 27 wheels. How many bicycles and tricycles are in the store?



What we have to do to solve this problem? We don't yet know how to create equations, and how to solve them. But we do have necessary knowledge to find an answer for the question.

If all of them would be bicycles, we will have

$$12 \cdot 2 = 24 \text{ wheels}$$

But there are 27 wheels. It means that

$$27 - 24 = 3 \text{ wheels}$$

are need to be added, three cycles have three, not two wheels.

Similarly, we can first, suppose that all are tricycles, the number of wheels will be

$$12 \cdot 3 = 36 \text{ wheels.}$$

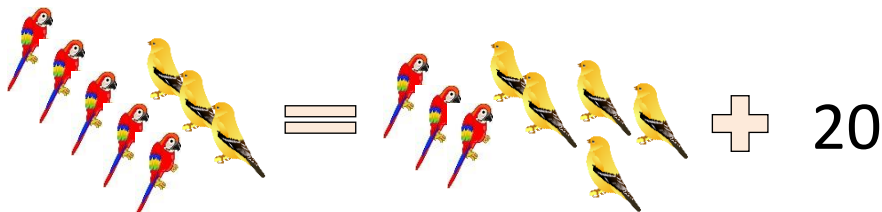
We have

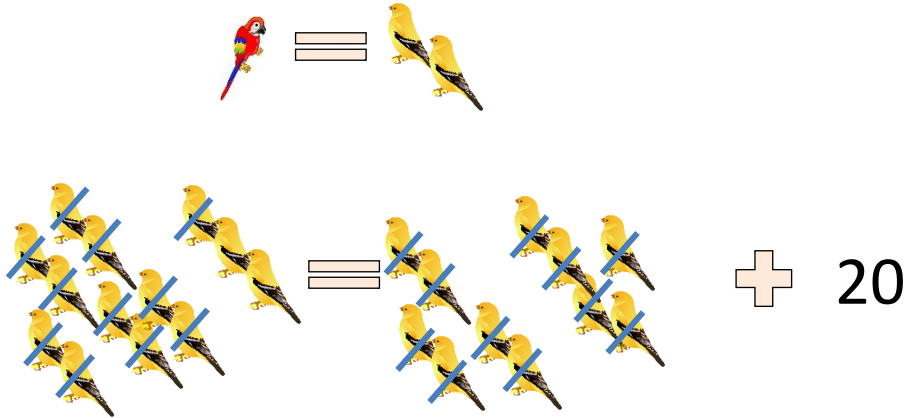
$$36 - 27 = 9 \text{ more wheels}$$

It means, nine bicycles have only two wheels.

Another problem:

Mary brought 5 parrots and 3 canaries from the store. Parrots were twice as expensive as canaries, she said. And if she bought 5 canaries and 3 parrots, she would spend \$20 less. What is the price for canary? We can even draw the problem:





We can see that two canaries are \$20. Therefore, one canary is \$10.

Read the following “word problems”. What can you tell about each of them? Try to solve them.

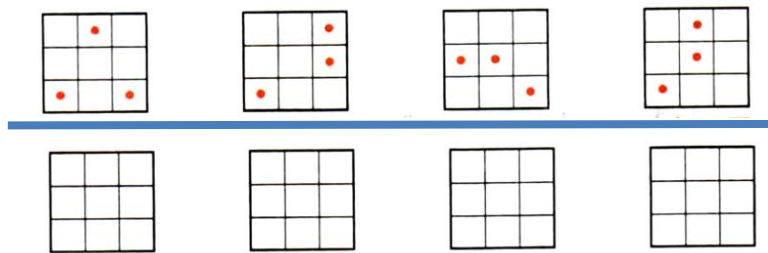
- a) Jessica is older than Sam, Ann is older than Jessica, and Robert’s age is same as Sam’s. Who is the oldest?
- b) Mike has 25 cards; John has 5 cards more than Mike. How many cards do John, Mike and Robert have altogether?
- c) On a farm there were 6 cows and 20 sheep. Each cow gives 4 gallons of milk every day. How many farm animals were there on the farm?
- d) In a math class 10 students were solving problems. Each student solved exactly 5 problems. How many students did solve 7 problems?
- e) In a math class 10 students were solving problems. Each student solved at least 5 problems. How many students did solve 7 problems?
- f) Two circles touch at a single point (tangent circles). One has radius of 10 cm and the other has radius of 6 cm. What is the distance between the centers of these circles?

9. Fill the empty spaces:

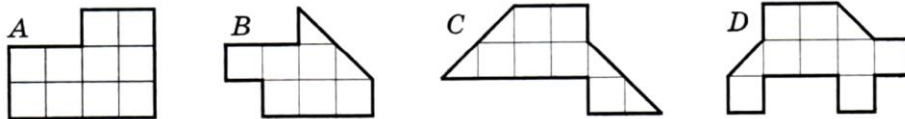
$$\begin{array}{r}
 \times 3 \square 0 5 \square \\
 \hline
 8 \square \square \\
 \square \square \square 4 5 \\
 \hline
 \square 9 6 \square \square \\
 \hline
 2 \square \square \square \square \square 0
 \end{array}$$

$$\begin{array}{r}
 \times 2 \square 7 \\
 \hline
 6 \square 2 \square \\
 4 3 \square \\
 \hline
 \square \square 1 \\
 \square \square \square \square \\
 \hline
 \square \square \square \square \square 0
 \end{array}$$

10. Look at the squares with points during 10 seconds. Cover the upper part of the picture and draw point in the empty squares.



11. Divide each of the figure below into two equal part along the grid.



12. "How old are you?" Mary asked Alex.

"If my age is tripled and then reduced by 16, I would be 17." answered Alex. How old is Alex?

13. There are 100 steps between first and fifth floor. How many steps between floors (there is equal number of steps between each floor)?