Math 4e. Classwork 18.

Algebra.

One percent (**1%**) means 1 per 100.

1 percent of quantity is a $\frac{1}{100}$ th part of it.

1% of this line is shaded green: it is very small isn't it?

Examples:

1. Find:
   a. 1% from 100
   b. 7% from 200
   c. 100% from 49
   d. 1% from 300
   e. 20% from 15
   f. 120% from 250
   g. 5% from 50
   h. 25% from 48
   i. 200% from 300

1% of 100 is $\frac{100}{100} \cdot 1 = 1$

7% of 200 is $\frac{200}{100} \cdot 7 = 200 \cdot \frac{7}{100} = 200 \cdot 0.07 = 2 \cdot 7 = 14$

By dividing 200 by 100 we can find what is 1% ($\frac{1}{100}\ part$) of 200 and we need to take 7 such parts:

$$\frac{200}{100} \cdot 7 = 200 \cdot \frac{7}{100} = 200 \cdot 0.07$$

120% of 250 is $\frac{250}{100} \cdot 120 = 250 \cdot 1.2 = 300$

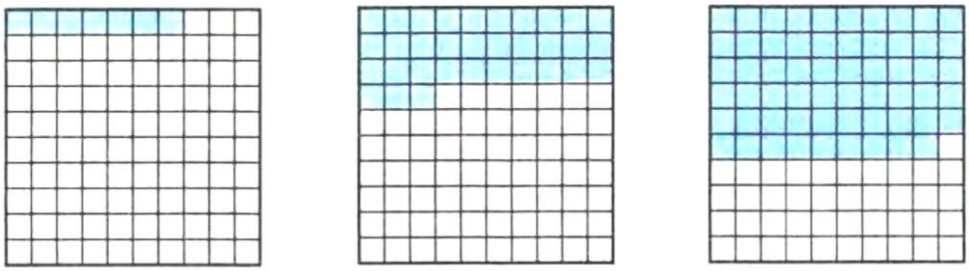
2. Find a number, if
    a. 1% of it is 2;
    b. 10% of it is 12;
    c. 15% is 150;
    d. 3% of it is 0.24;
    e. 200% of it is 400;
    f. 100% of it is 0.1;
    g. 50% of it is 1;
    h. 25% of it is 30;

    If 1% of a number is 2, the number is $\frac{2}{1} \cdot 100 = 200$
    If 10% of a number is 12, the number is $\frac{12}{10} \cdot 100 = 12 \cdot \frac{100}{10} = 12 : 0.10 = 120$
    By dividing 12 by 10 we can find what is 1% of a number we are looking for, and then we have to take 100 of such 1%.
    Or it can be seen as dividing 12 by 0.10 ($10\% = \frac{10}{100}$).
    If 3% of a number is 0.24, the number is $\frac{0.24}{3} \cdot 100 = 0.24 \cdot 100 : 3 = 0.24 : 0.03 = 8$

3. How many squares we have to shade to shade 10% of the line, 15%, 20%, 25%?

4. In a department store, there is a sale of 25% off on everything. How much does the dress cost if its price before sale was $80? How much this dress will cost if an additional sale of 30% of will be applied?

5. What percent of each square is shaded on the picture below?



6. There are 40000 books in a library. 75% of all books are in English,10% of all books are in Spanish and the rest of the books are in French and German. How many books are there in the library in English and in Spanish?

7. Grapes were dried to raisin. During the process, the weight of grapes was reduced by 70%. How many kilograms of raisin was produced from 200 kg of grapes? How many kilograms of grapes were dried if the weight of obtained raisin is 15 kg?

8. There are 250 g of cherry jam which has 30 % sugar in it and 300 g of cherry jam with 50 % of sugar in it. Two portions of the confiture were combine together. What is the percentage of sugar in the final product?

9. Fresh watermelon weighted 10 kg and contained 99% of water. In the store the watermelon lost some amount of water and now contains only 98% of water. What is its weight now?

10. Bronze is an alloy of tin and copper. (Tin and copper are metals; they are melted together to get an alloy which is called bronze). How much copper and how much tin are there in the 80 kg piece of bronze, if the ratio of tin to copper in bronze is 3 to 17?

11. There are 255 seats in a theater. 170 tickets were sold for a movie. Which percent of the total number of seats will be empty if only 90% of the people, who bought tickets will show up for the movie?

12. The ratio of boys to girls in 6^{th} grade is $\frac{9}{11}$. The ratio of girls to boys in 7^{th} grade is $\frac{31}{29}$. There are 100 and 120 students in 6^{th} and 7^{th} grades correspondingly, what is a ratio of boys to girls at the dance for 6 and 7 grade students, if all students came to the dance.

13. A dog and a cat share the food. Alone the dog eats this amount of food three times as fast as the cat. Together they finish their food in 12 minutes. How many minutes does it take the dog to eat his food alone? How many minutes does it take the cat?

14. Triplets, Justin, Jason, and Jacob are working on a school project. Justin can complete the project by himself in 6 hours, Jason can complete the project by himself in 9 hours, and Jacob can complete the project by himself in 8 hours. How long would it take the triplets to complete the project if they work together?