Math 4d. Class work 20.

Algebra.

$7\frac{1}{2}x = 15$

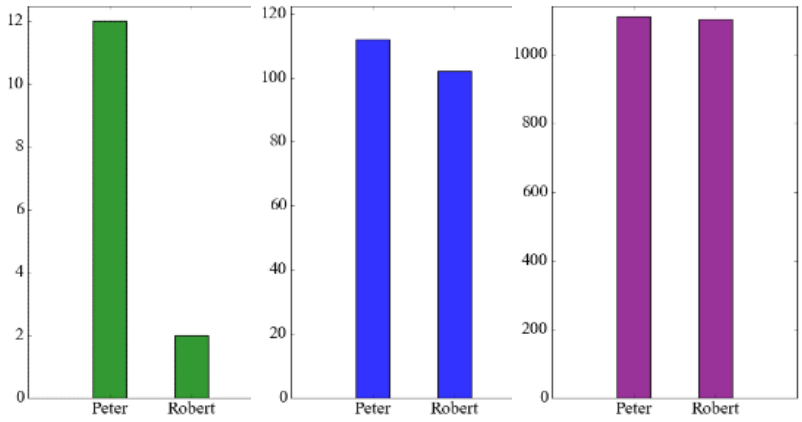
$\frac{6}{x+1} = \frac{1}{2}$

$1 + \frac{5}{x+2} = 4$

Ratio and percent.

Peter has 10 dollars more then Robert. Is this a big difference? How we can compare the amount of money they have?
Take a look at the table

Peter	$12	$112	$1112
Robert	$2	$102	$1102



In all these cases the absolute difference is the same, but in the first case Peter has 6 times as much as Robert, in the last situation they both have almost the same amount of money. The ratios of the amount of Peter's money and Robert's money are.

$\frac{12}{2}$; $\frac{112}{102}$; $\frac{1112}{1102}$;

The amount of money Peter and Robert have in the first case is 12 and 2 dollars and the ratio is $\frac{12}{2} = 6$, or 6:1, or 6 to 1.

> The ratio of two numbers indicates how many times one number is larger than another or which part of one number the other number is.

Example1: (**it's not a real recipe**) The ratio of water and lemon juice in lemonade is 4 to 1. What does it mean? In means that for each part of lemon juice we need to add 4 parts of water.

How much of lemon juice and water we need to prepare 1 l. of lemonade? 1.5 l.?

We want to have sweet lemonade and we add sugar. The ratio of water, lemon juice and sugar is 4:1:0.5 (or it can be rephrased as 8:2:1). For each part of sugar, we will use 2 parts of lemon juice, and 8 parts of water.

We can write the ratio of two numbers in the several ways:

$$a \text{ to } b, \qquad a{:}\, b, \qquad \frac{a}{b}$$

Example2: To make pancakes we use 3 cups of flour and 2 cups of milk.

So the ratio of flour to milk is **3 : 2,** which means that for each 2 cups of milk we need to have 3 cups of flour. To make pancakes for a LOT of people we might need 4 times the quantity, so we multiply the numbers by 4:

$$(3 \cdot 4) : (2 \cdot 4) \;=\; 12 : 8 \qquad \left(\frac{3 \cdot 4}{2 \cdot 4} = \frac{12}{8}\right)$$

In other words, 12 cups of flour and 8 cups of milk.

The ratio is still the same, so the pancakes should be just as yummy.

Example3: Three brothers, 5, 7, and 9 years old went to trick-o-treat. They got 84 sweets altogether. They decided to divide the candies in the ratio of their age 9:7:5. How many candies each of them should get?

To divide all candies between the brothers we need to find the “unit” part of the total amount of candies. The oldest brother should get 9 of such units, the middle one should get 7, and the youngest brother will get 5. Total amount of units is $9 + 7 + 5 = 21$. The number of candies is 84, so the “unit” contains $84 : 21 = 4$ candies.

So, the first brother will get $4 \cdot 9 = 36$ candies, the second will get $4 \cdot 7 = 28$, and the third will get $4 \cdot 5 = 20$. $36 + 28 + 20 = 88$

Example 4.

Draw the segment [AB] 6cm. Mark the point C in such a way that the ratio of the length of the segments are

$a.\ \frac{|AC|}{|BC|} = 1,$ $b.\ \frac{|AC|}{|BC|} < 1;$ $c.\ \frac{|AC|}{|BC|} > 1;$ $d.\ \frac{|AC|}{|BC|} = 2$

First, we need to draw a segment 6 cm long. Use ruler!

a. The lengths of the segments [AC] and [CB] should be the same, because the ratio is 1. So, we have to mark our point C right in the middle.

b. Length of the segment [AC] should be smaller than the length of the segment [CB].

c. Length of the segment [AC] should be greater than the length of the segment [CB]

d. The segment [AC] should be twice as long as the segment [CB]: |AC|=4 cm, |CB|=2 cm.

1. In a dried fruit mix, there are 7parts of dried apples, 4 parts of dried pears and 5 parts of dried apricots. (So, it can be said, that the amount of apples, pears, and apricots should be mixed in the ratio 7:4:5). What is the weight (how many grams) of apples, pears, and apricots in the fruit mix, if the total weight of the mix is 1600g?

2. In order to prepare a homemade dried fruits and nuts mix Mary took 6 parts of raisins, 5 parts of dried cranberries and 3 parts of walnuts. Cranberries and walnuts altogether weighted 2 kg 400 g. What was the weight of the mix that Mary prepared?