

Math 5b, homework 24.



1. In the park there were linden trees and maple trees. Maples made up 60% of them. In spring, linden trees were planted, after which maples made up 20%. In autumn, maples were planted, and maples again made up 60%. By what factor did the total number of trees in the park increase over the year?

2. Evaluate:

a. $\frac{3^{10} \cdot (3^2)^4}{(3^5)^3 \cdot 3}$;

b. $\frac{(5^2)^6 \cdot (5^7 : 5^4)}{(-125)^5}$

c. $\frac{32^4 \cdot (-2)^8 : 64^3}{-128^3 : (-8)^4}$

3. A patrol boat is traveling along a river where the current speed is 2 km/h. In 6 hours going downstream and 8 hours going upstream, the boat traveled 164 km. How long will it take to travel 54 km on a lake if its speed relative to the water remains the same?

4. Open parenthesis and combine like terms (simplify):

Example:

$$4(m + 5n) - 5(m - 3n) = 4m + 20n - 5m + 15n = -m + 35n$$

a. $-3 \cdot (a + b) + 2(a - b)$;

b. $2(m - 4n) - 4(m - 2n)$;

c. $5 \cdot (x - 5) - 3(2x - 9)$;

d. $2y^2 - y(y - 3) + y(2 - y)$;

5. Alex wrote down a huge number by writing the natural numbers from 1 to 500 in a row:
123...10111213...499500.

Jake erased the first 500 digits of this number.

What digit does the remaining number start with?

6. In a school choir, the ratio of the number of 5th graders to the number of 6th graders is 5 : 8.
Solve the following problems:

a. How many 5th graders are in the choir if there are 16 6th graders?

b. How many 5th and 6th grade students are there in total in the choir if there are 20 5th graders?

c. How many 5th and 6th grade students are there in total in the choir if there are 9 more 6th graders than 5th graders?

d. How many more 6th graders are there than 5th graders if there are 26 5th and 6th graders in total?