Math 4b. Classwork 25.

How many different phone numbers exist? In the United States, phone numbers are represented as a 10-digit number, with the first 3 digits as the area code, the next 3 digits as the central office code, and the last 4 digits as the line number.

$$\underbrace{NMX}_{area\ code} \qquad \underbrace{NXX}_{central\ office\ code} \qquad \underbrace{XXXX}_{line\ number}$$

Area codes can't start with 0, and 1, middle digit can't be 9.

Central office codes can't start with 0 or 1.

Line number can have any of the 10 digits in any place.

Total number of possible phone numbers is

8 possibilities for 1st digit of the area code, 9 possible digits for the 2nd digit, 10 possibilities for the 3rd.

8 possible digits for the 1st digit of the central office code, 10 possibilities for the 2nd and 10 for the 3rd.

Line number can use any of the digits.

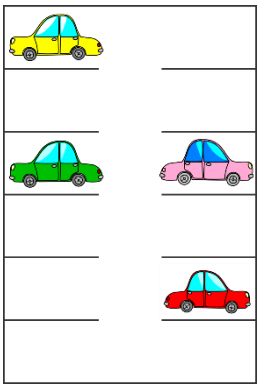
$$8 \cdot 9 \cdot 10 \cdot 8 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 8^2 \cdot 9 \cdot 10^7 = 576 \cdot 10^7$$

Exercises:

1. Peter took 5 exams at the end of the year. Grades for exams are A, B, C, D. How many different ways are there to fill his report card?

2. Appartment bulding has 12 appartments and a parking for 12 cars (each family has different car). How many different way are there to park these 12 cars?

3. Today there were only 4 cars at the parking lot. How many different ways are there to park 4 cars on a 12-place parking lot?



4. Winnie the Pooh and Piglet shared a cake. Piglet whimpered that he didn't get enough. Then Pooh gave him a third of his share. From this, Piglet's amount of cake has tripled. What part of the cake did Pooh have at first and what part did Piglet have?

5. Students from 4^{th} and 5^{th} grades got 286 textbooks in the library. 5^{th} grade students got by 20% more text books then 4^{th} grade students. How many textbooks got 5^{th} graders?

6. Positive or negative numbers is the number:

$a. -5 \cdot 7^{24}$; $b.\ (-5 \cdot 7)^{18}$; $c.\ 5 \cdot (-7)^{7}$; $d.\ -(5 \cdot 7)^{8}$;

7. Put the numbers in increasing order:

$a. -0.11$; $(-0.11)^2$; $(-0.11)^3$; $(-0.11)^4$;

$b. \left(\frac{1}{3}\right)^{30}$; $\left(-\frac{1}{5}\right)^{30}$; $-\left(\frac{1}{7}\right)^{30}$;

$c. \left(\frac{1}{8}\right)^{100}$; 3.5^0; -7^{22}; $(-1)^{73}$; $(-8)^{30}$; $(-2)^{19}$; $\left(\frac{1}{8}\right)^{101}$

8. A number a is marked on the number line. Which of the following inequalities is incorrect?

$a.\ \frac{1}{a} < -1$ $b. -\frac{1}{a} > 1$ $c. \frac{1}{a} < -a$; $d. -\frac{1}{a} < a$