

Math 5b, homework 24.



1. Prove that numbers  $\overline{abab} - \overline{baba}$  is divisible by 9, ( $a$  and  $b$  are digits,  $\overline{abab}$  is 4-digit number.

For example, it's true for

$$4343 - 3434 = 909, 909 \text{ is divisible by } 9.$$

Is it true for any such number?

2. Today, the number of absent students is  $\frac{1}{9}$  of the number of students present in class.

What percentage of the total number of students in the class are absent?

3. Please think about this problem:

Find the sum of

$$\frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \frac{1}{5 \cdot 6} + \dots + \frac{1}{2022 \cdot 2023};$$

Hint: represent each fraction as a difference of two fractions.

We will use the result if this exercise to solve problem in class.

4. There are 30% fewer students in 6th grade than in 5th grade, and 20% fewer students in 7th grade than in 6th grade. How many percent fewer students are there in 7th grade than in 5th grade?

5. Prove that the fraction

$$\frac{m(m-5)}{2}$$

is always an integer for any natural number  $m$ .

6. Write the following expressions without parenthesis.

Example:  $a - (-b) + (-c) = a + b - c$

a.  $-x + (-y) + (-z) - d;$                       b.  $a - c - (-b) - (-d);$

c.  $a - (-x) + (-y) - (-c);$                       d.  $-m + (-n) + (-p);$

7. Find the area of a triangle. Draw an altitude, measure altitude and opposite side, find area. Check your answer with another pair of altitude and side.





