**Math 5b, homework 4.**

1. Simplify the expressions:

   Example: $2^4 + 2^4 + 2^4 + 2^4 = 4 \cdot 2^4 = 2^2 \cdot 2^4 = 2^{2+4} = 2^6$

   a. $2^4 + 2^4$;  b. $2^4 \cdot 2^4$;

   c. $3^2 + 3^2 + 3^2$;  d. $3^2 \cdot 3^2 \cdot 3^2$;  e. $\underbrace{3^4 + \cdots + 3^4}_{9\ times}$;

2. Compute:

   a. $-4 - (-9)$;  b. $-\left(-8 + (-4)\right)$;  c. $-3 - (9 + (-6)$;

   d. $-3 - (-7) + (-5)$:  e. $-2 \cdot (-5) \cdot (-2)$;  f. $-\dfrac{3}{5} - \left(-1\dfrac{1}{3}\right)$;

3. Use the distributive property and simplify fractions and evaluate:

   Example:
   $$\frac{24 \cdot 11 - 24 \cdot 3}{300} = \frac{24(11 - 3)}{300} = \frac{24 \cdot 8}{3 \cdot 100} = \frac{8 \cdot 8}{100} = \frac{64}{100} = 0.64$$

   a. $\dfrac{15 \cdot 9 - 15 \cdot 6}{9 \cdot 30}$;  b. $\dfrac{17 \cdot 4 + 17 \cdot 9}{34 \cdot 52}$;  c. $\dfrac{18 \cdot 7 + 18 \cdot 3}{1200}$;  d. $\dfrac{24 \cdot 11 - 24 \cdot 3}{300}$

4. Solve the equations:

   a. $\dfrac{3}{4} + \left(\dfrac{5}{8} + t\right) = \dfrac{11}{12} + \dfrac{7}{8}$;  b. $\left(\dfrac{4}{5} - k\right) - \dfrac{1}{3} = \dfrac{1}{6} - \dfrac{1}{10}$

5. In Peter's bottle there is 10% more soda than in John's bottle. Peter drank 11% of his soda, while John drank 2% of his soda. So, who has more soda left?

6. Solve the riddle (each letter represents a unique digit):

   $$\begin{array}{r} \text{LOGIC} \\ + \text{LOGIC} \\ \hline \text{PROLOG} \end{array}$$

7. Find the two-digit number that is 5 times greater than the sum of its digits.

8. Find the numbers that are equal to twice the sum of their digits.