MATH 4: Homework 22

Due March 17, before the start of the class

Homework must be submitted on time—at least 15 minutes before the start of the class. Homework will not be graded after the solutions are posted on Google Classroom.

Write the answers on separate sheets of paper, not between the lines.

1. What should be the exponent for the equation to hold?

   $a.\ 5^{*} = 125;$ $b.\ 4^{*} = 256;$ $c.\ 9^{*} = 81;$ $d.\ 7^{*} = 49$

2. What digits should be put instead of * to get true equality? How many solutions does each problem have?

   $a.\ (2\,*)^2 = **\ 1;$ $b.\ (3\,*)^2 = ***\ 6$

   $c.\ (7\,*)^2 = ***\ 5$ $d.\ (2\,*)^2 = **\ 9,$ $e.\ (3\,*)^2 = **\ 1$

3. Reduce the fractions. Hint: in b) 27 and 81 can be written as powers with base 3

   $a.\ \frac{49^4 \cdot 7^5}{7^{12}};$ $b.\ \frac{3^{10} \cdot 27}{81^3};$ $c.\ \frac{125^3 \cdot 5^7}{5^{18}};$

4. The houses of Winnie the Pooh and Piglet are on the same long street, 2 km apart. At the same time, they started moving in opposite directions. Pooh was walking at a speed of 3 km/h, and Piglet was running at a speed of 6 km/h. How far from each other will they be in 10 minutes?

5. The cats of the Siberian, Angora, Persian, and Siamese breeds were presented at the cat exhibition. Siamese cats were twice as many as Angora cats, Persian cats were 1.5 times more than Siamese cats, and Siberian cats were 13 fewer than Persian cats. How many cats of each breed were there if there were 77 cats in total?

6. Evaluate in the most convenient way (use the distributive property):

   $a.\ 17 \cdot 34 + 26 \cdot 17 + 13 \cdot 60;$ $b.\ 4 \cdot 45 + 4 \cdot 55 + 6 \cdot 55 + 6 \cdot 45;$