1) Compare the following exponents:

a. 2^{10} *and* 10^3; *b.* 10^{100} *and* 100^{10}

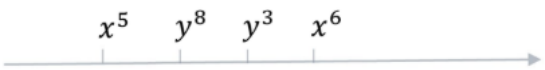
c. 2^{300} *and* 200; *d.* 31^{16} *and* 17^{20}; *e.* 4^{53} *and* 15^{45}

2) Solve the following equations:

a. $2^x \cdot 2^{2x} = 64$; *b.* $3^n \cdot 9 = 81$; *c.* $5^p = 1$

3) $x^5 < y^8 < y^3 < x^6$

Where 0 should be placed?



4) Write the numbers 245 and 324 in 6-based place-value system. Remember, that in this system you will have only 0, 1, 2, 3. 4, and 5 as digits.

5) How to arrange 127 1-dollar bills in seven wallets so that any amount from 1 to 127 dollars could be issued without opening the wallets?

6) Robert thought of a number not less than 1 and not more than 1000. Julia is allowed to ask only such questions to which Robert can answer "yes" or "no" (Robert always tells the truth). Can Julia determine the hidden number in 10 questions?

7) Write the numbers 234_6 and 403_6 written in the 6-based place-value system (small number 6 shows that the number is not in decimal, but in 6-based system) in decimal system.

8) Evaluate the following using fractions:

a. $\frac{2}{3} + 0.6$; *b.* $1\frac{1}{6} - 0.5$; *c.* $0.3 \cdot \frac{5}{9}$; *d.* $\frac{8}{11} : 0.4$;

9) Mr. Robinson was paid $590 for a job that required 40 hours of work. At this rate, how much should he be paid for a job requiring 60 hours of work?

10) A merchant accidentally mixed candies of the first type (priced at $3 per pound) with candies of the second type (priced at $2 per pound). At what price should this mixture be sold to obtain the same total amount, given that it is known that initially the total cost of all candies of the first type was equal to the total cost of all candies of the second type?

11) Represent as fractions;

$1.23\overline{56}$, $5.4\overline{345}$

12) Solve the equations:

a. $3 - \left(\frac{2}{9}m + \frac{1}{6}\right)$; *b.* $2.6y - 0.2(3y - 9) = -0.5 \cdot (2y + 6)$;

13) Multiply.

a. $(a + 2)(a + 2)$; *f.* $(a + 1)(a + 3)$;

c. $(3 + x)(3 - x)$; *h.* $(y - 2)(3 - y)$;