Exercises:

1. The sum of two natural number is 45. First number gives a remainder of 4 when divided by 12, the second gives a remainder 5 when divided by 12. What are these numbers?

2. Apples lose 85% of their weight when dried. How much of dried apples can be made from 200 kg of fresh apples.

3. Mushrooms lose 90% of their weight when dried. How many fresh mushrooms did it take to get 5 kg of dried mushrooms.

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

   $a.\ (2*)^2 = **1;$ $b.\ (3*)^2 = ***6$ $c.\ (7*)^2 = ***5$ $d.\ (2*)^2 = **9$

5. Evaluate:

   $(-3)^2;$ $-3^2;$ $(-3)^3;$ $2^7;$ $(-2)^7;$ $-2^7;$ $(2\cdot3)^3;$ $2\cdot3^3;$ $\left(\dfrac{1}{3}\right)^2;$ $\dfrac{1}{3^2};$

6. Let's take a look on a sequence of numbers:

   $2,$ $2^2,$ $2^3,$ $2^4, ...$ 2^{12}

   What are the last digits of this numbers? Can you tell the last digit of $2^{13},$ $2^{14},$ 2^{15}?
   What about $2^{32},$ $2^{49},$ 2^{62}?

7. Compare the following exponents:

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

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

8. Compare numbers a and a^2 if
   $a.\ a < 0;$ $b.\ 0 < a < 1;$ $c.\ a > 1$

9. Write as a power:
   Example:
   $$\frac{1}{2} = 2^{-1};\qquad \frac{1}{4} = \frac{1}{2^2} = 2^{-2}$$
   $$\frac{1}{3};\qquad \frac{1}{25};\qquad \frac{1}{27};\qquad \frac{1}{125};$$