# Tutorial #1. Numbers

## Hometask

**Integers**

Prove or disprove:

1) If a*b = a: prove that b = 1
2) The difference of any two odd integers is even.

**Prime numbers**

1) Is $n^k - 1$ prime for any integers *n* and *k*?
2) Is expression $n^2 - n + 41$ a prime number?

**Divisibility**

1) Prove that sum of 2n + 1 consecutive numbers is divisible by 2n + 1
2) Find quotient and divisor of:
    a. $n^3 + 2n - 1$ divided by n;
    b. $12n^5+10n^4+2$ divided by 2n + 1;

**Rational numbers and Real numbers**

Write each rational number as a ratio of two integers:

- 0.462716271…
- 12.1121121…

Prove or disprove :

1) If ***r*** is any rational number, then $3r^2 - 2r + 4$ is rational.
2) Product and sum of two rational numbers is rational.