

1. Transform the following fraction, so that the sign before fraction is changed to the opposite:

Example:

$$-\frac{x}{x-3} = \frac{x}{-(x-3)} = \frac{x}{3-x}$$

a. $\frac{1-x}{3};$

b. $-\frac{1}{2x+3y};$

c. $\frac{x-y}{x+y}$

d. $\frac{-a-b}{x+y};$

e. $-\frac{a^2+1}{a-2};$

f. $-\frac{-x-y}{-a-b}$

2. Prove, that

a. $(m-n)(m^2+mn+n^2) = m^3-n^3$

b. $(m+n)(m^2-mn+n^2) = m^3-n^3$

3. Rewrite as polynomial:

a. $\left(\frac{1}{2}+a\right)^2;$

b. $(1.1+p)^2$

4. Represent polynomials as a square of sum of two monomials:

Example:

$$x^2+2xy+y^2 = (x+y)^2$$

a. $9m^2+6mn+n^2;$

b. $3x^2+2x+1;$

c. $16p^2+40pq+25q^2;$

d. $4m^2+9n^2+12mn;$

e. $a^6+2a^3b^3+b^6;$

5. Instead of C and D put the right monomials:

a. $(a+C)^2 = D+2ab+b^2;$

b. $(C+3m)^2 = 4n^2+12mn+9m^2$

c. $(D+C)^2 = 9p^2+30pq+25q^2;$

d. $(C+D)^2 = 64n^2+16n+1$

6. It is known that the number a is divisible by number b . Are the following fractions reducible (can be simplified)?

a. $\frac{a-b}{a+b}$

b. $\frac{2a+3b}{5a-b}$

7. Add fractions:

a. $\frac{1}{x} + \frac{1}{y} + \frac{1}{xy};$

b. $\frac{1}{b^3} - \frac{2}{b^2} + \frac{1}{b};$

8. There are two cups, one with coffee and another one with milk (the amounts of coffee and milk are the same). One teaspoon of coffee is poured into milk and mixed. Then one teaspoon of mixture is poured into coffee. Is there now more coffee in the milk, or milk in the coffee? (explain your answer, the probability to guess the right answer is 1/3.)
9. Fresh watermelon weighed 10 kg and contained 99% of water. In the store the watermelon lost some amount of water and now contains only 98% of water. What is its weight now?