

Quadratic formula

№1. Solve by completing the square:

1. $x^2 + 26x + 169 = 0,$

3. $121x^2 - 22x + 1 = 0,$

2. $10x^2 - 160x + 640 = 0,$

4. $x^2 + 40x - 500 = 0.$

$$ax^2 + bx + c = 0 \implies x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-b \pm \sqrt{D}}{2a}$$

№2. Solve using the quadratic formula:

1. $x^2 - 16x + 48 = 0,$

3. $2x^2 + 7x - 9 = 0,$

2. $x^2 - 7x - 30 = 0,$

4. $x^2 + 0.9x - 0.36 = 0.$

№3. Solve using the quadratic formula:

1. $(6 - x)(2x - 5) = \frac{49}{8},$

3. $(4x + 12)(5 - 19x) + (13x + 2)^2 + 10,$

2. $(3x - 2)^2 = \frac{(2x - 6)(x + 3) - 17}{2},$

4. $2(4x - 1)(x + 1) - (4x + 1)(x - 1) + 7.$

№4. Solve using the quadratic formula:

1. $(2x - 5)(x + 2) = 18,$

5. $(2x - 1)(2x + 1) - x(1 - x) = 2x(x + 1).$

2. $(4x - 3)^2 + (3x - 1)(3x + 1) = 9,$

6. $2x^2 + x\sqrt{5} - 15 = 0,$

3. $(x + 3)^2 - (2x - 1)^2 = 16,$

7. $x^2 - x(\sqrt{6} - 1) - \sqrt{6} = 9,$

4. $(x + 7)(x - 8) - (4x + 1)(x - 2) = -21x,$

8. $\frac{4x^2 + x}{3} - \frac{x^2 + 17}{9} = \frac{5x - 1}{6}.$

№5. Find a natural number whose square is 42 greater than the number itself.

№6. Find the perimeter of a rectangle whose area is 70 cm², and one side is 9 cm longer than the other.

№7. For which values of the parameter a is the number $\frac{1}{4}$ a root of the equation $a^2x^2 + ax - 5 = 0$?

№8. For which values of the parameter a does the equation have two roots:

1. $ax^2 + 4x + 3 = 0,$

2. $a(2a + 4)x^2 - (a + 2)x - 5a - 10 = 0?$