

Solve equation:  $-4x^2-19x+23=0$

Find variable with exponent  $x^2$

$-4x^2-19x+23=0$  is quadratic equation (it has exponent  $x^2$ )

$-4x^2-19x+23=0$  equation is in proper form

right side  $0$  is equal to zero

The equation  $-4x^2-19x+23=0$  is in the proper form  $ax^2+bx+c=0$

Find terms with coefficients a, b, c

$$-4x^2-19x+23=0$$

List the values for a, b, and c.

$$a=-4 \quad b=-19 \quad c=23$$

Substitute the values into the quadratic equation

simplify the expression and find the two solutions for x by adding and then subtracting in the numerator

$$x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a} = \frac{-(-19) + \sqrt{19^2 - 4 * (-4) * 23}}{2 * (-4)} = \frac{19 + \sqrt{361 + 368}}{-8} = \frac{19 + 27}{-8} = 5.$$

$$x_1 = \frac{-b - \sqrt{b^2 - 4ac}}{2a} = \frac{-(-19) - \sqrt{19^2 - 4 * (-4) * 23}}{2 * (-4)} = \frac{19 - \sqrt{361 + 368}}{-8} = \frac{19 - 27}{-8} = 1.$$

The two solutions for the variable x are  $x=5.75$  and  $x=1$