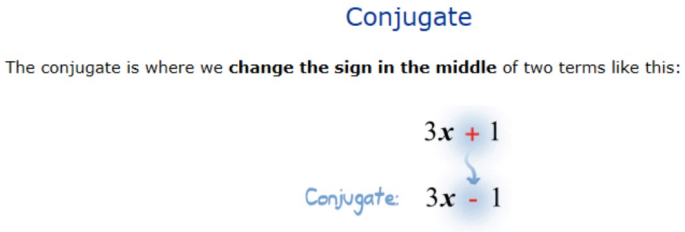
Factors such as (a + b) and (a - b)
are called CONJUGATES



Complex Conjugates: a + bi and a - bi

(7 + 4i)(7 - 4i) =

The product of complex conjugates is always
a constant

Find all Complex Solutions (real and imaginary).

1. $5 - 2x^2 = 101$

$-5 \quad -5$

$\frac{-2x^2}{-2} = \frac{96}{-2}$

$\sqrt{x^2} = \sqrt{48}$

$x = \pm 4i\sqrt{3}$

2. $4x^2 + 83 = 26$

$-83 \quad -83$

$\frac{4x^2}{4} = \frac{-57}{4}$

$x = \pm \frac{i\sqrt{57}}{2}$

Find all Complex Solutions (real and imaginary).

3. $(x + 7)^2 + 38 = 13$

$-38 \quad -38$

$\sqrt{(x+7)^2} = \sqrt{-25}$

$x + 7 = 5i$

$-7 \quad -7$

$x = \pm 5i - 7$

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

$-16 \quad -16$

$\sqrt{(x-2)^2} = \sqrt{-15}$

$x - 2 = \pm i\sqrt{15}$

$x = 2 \pm i\sqrt{15}$

Complex solutions when using the Quadratic Formula

Solve.

$x^2 - 6x + 25 = 0$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$b^2 - 4ac = -64$

$\dfrac{6 \pm \sqrt{-64}}{2}$

$\dfrac{6 \pm 8i}{2} = 3 \pm 4i$

Solve.

$2x^2 - 10x + 17 = 0$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$b^2 - 4ac = -36$

$\dfrac{10 \pm \sqrt{-36}}{4} = \dfrac{10 \pm 6i}{4} = \dfrac{5 \pm 3i}{2}$

Solve.

$3x^2 - 2x + 7 = 0$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$b^2 - 4ac = -80$

$4 - 4 * 3 * 7 =$

$\sqrt{80} = \sqrt{16 \cdot 5}$

$4\sqrt{5}$

$\dfrac{2 \pm \sqrt{-80}}{6} = \dfrac{2 \pm 4i\sqrt{5}}{6} = \dfrac{1 \pm 2i\sqrt{5}}{3}$

Solve.

$-5x^2 + 3x - 8 = 0$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$b^2 - 4ac = -151$

$\dfrac{-3 \pm \sqrt{-151}}{-10} = \dfrac{-3 \pm i\sqrt{151}}{-10}$