Factor
Graph
Quad Formula
Complete Square

Solve by Completing the Square

$-\frac{7}{2} + \frac{81}{16}$

$-\frac{56}{16} + \frac{81}{16}$

$-\frac{9}{4} + \frac{5}{4}$

$-\frac{9}{4} - \frac{5}{4}$

$\frac{4}{3} + \frac{4}{9}$

$\frac{12}{9} + \frac{4}{9} = \frac{16}{9}$

$f(x) = x^2 + 2x - 9$

$0 = x^2 + 2x - 9$

$9 = x^2 + 2x + 1$

$+1 \quad +1$

$\sqrt{10} = \sqrt{(x+1)^2}$

$\pm\sqrt{10} = x + 1$

$x = -1 \pm \sqrt{10}$

$x^2 - 4x = 2x + 35$

$x^2 - 6x + 9 = 35 + 9$

$\sqrt{(x-3)^2} = \sqrt{44}$

$x - 3 = \pm\sqrt{44}$

$x = 3 \pm \sqrt{44}$

$3 \pm 2\sqrt{11}$

$3x^2 - 4x - 4 = 0$

$x^2 - \frac{4}{3}x - \frac{4}{3} = 0$

$x^2 - \frac{4}{3}x + \frac{4}{9} = \frac{4}{3} + \frac{4}{9}$

$\sqrt{\left(x - \frac{2}{3}\right)^2} = \sqrt{\frac{16}{9}}$

$x - \frac{2}{3} = \pm\frac{4}{3}$

$x = \frac{2}{3} \pm \frac{4}{3}$

$\frac{2}{3} + \frac{4}{3} \qquad \frac{2}{3} - \frac{4}{3}$

$2 \qquad -\frac{2}{3}$

$x^2 - 12x = 28 + 36$

$x^2 - 12x + 36 = 64$

$\sqrt{(x-6)^2} = \sqrt{64}$

$x - 6 = \pm 8$

$x = 6 \pm 8$

$6 + 8 = 14$

$6 - 8 = -2$

$\frac{2x^2}{2} + \frac{9x}{2} + \frac{7}{2} = \frac{0}{2}$

$x^2 + \frac{9}{2}x + \frac{7}{2} = 0$

$x^2 + \frac{9}{2}x + \frac{81}{16} = -\frac{7}{2} + \frac{81}{16}$

$\sqrt{\left(x + \frac{9}{4}\right)^2} = \sqrt{\frac{25}{16}}$

$x + \frac{9}{4} = \pm\frac{5}{4}$

$x = -\frac{9}{4} \pm \frac{5}{4}$

$-1, -\frac{7}{2}$

$\frac{-3x^2}{-3} + \frac{24x}{-3} = \frac{27}{-3}$

$x^2 - 8x = -9 + 16$

$+16 \quad +16$

$\sqrt{(x-4)^2} = \sqrt{7}$

$x - 4 = \pm\sqrt{7}$

$x = 4 \pm \sqrt{7}$

$ax^2+bx+c=0$

Quadratic Formula

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

OR

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

$\frac{3+7}{4}$ $\frac{3-7}{4}$

$\frac{5}{2}, -1$

$\frac{7\pm\sqrt{49-(-144)}}{18}$

$\frac{7\pm\sqrt{193}}{18}$

$\frac{7}{18}\pm\frac{\sqrt{193}}{18}$

Solve each using the quadratic formula.

$a=2$ $b=-3$ $c=-5$

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

$\frac{3\pm\sqrt{(-3)^2-4(2)(-5)}}{2(2)}$

$\frac{3\pm\sqrt{9-(-40)}}{4}$

$\frac{3\pm\sqrt{49}}{4}=\frac{3\pm7}{4}$

$9n^2=4+7n$

$9n^2-7n-4=0$

$\frac{7\pm\sqrt{(-7)^2-4(9)(-4)}}{2(9)}$

$8a^2+6a=-5$

$2m^2-7m-13=-10$

$2m^2-7m-3=0$

$\frac{7\pm\sqrt{(-7)^2-4(2)(-3)}}{2(2)}$

$\frac{7\pm\sqrt{49-(-24)}}{4}$ $\frac{7\pm\sqrt{73}}{4}$

$8n^2+7n-15=-7$

$\frac{7}{4}\pm\frac{\sqrt{73}}{4}$

Complex Numbers

$a+bi$ (Real, Imaginary)

$i=\sqrt{-1}$

Simplify each imaginary number.

$\sqrt{-25}=\sqrt{25}\cdot\sqrt{-1}$ $5i$

$\sqrt{-81}=\sqrt{81}\cdot\sqrt{-1}$ $9i$

$-\sqrt{-100}$ $-10i$

$\pm\sqrt{-36}$ $\pm6i$

$\sqrt{-3}=\sqrt{3}\cdot\sqrt{-1}$ $\sqrt{3}i$ $i\sqrt{3}$

$\frac{1}{2}\pm\frac{\sqrt{3}}{2}i$

Operations of Complex Numbers

$a+bi+c+di$

$(a+c)+(b+d)i$

$(\sqrt{3})^2 =$

$i^2 = (\sqrt{-1})^2 = -1$

$i + 6i = 7i$

$-1 - 8i - 4 - i$

$-5 - 9i$

$-3 + 6i - (-5 - 3i) - 8i$

$-3+6i+5+3i-8i$

$2+i$

$4i(-2 - 8i)$

$-8i - 32i^2$

$-8i - 32(-1)$

$-8i + 32$

$32 - 8i$

$(-2 - i)(4 + i)$

$-8 - 2i - 4i - i^2$

$-8 - 6i - (-1)$

$-8 - 6i + 1$

$-7 - 6i$

$(8 + 3i)^2$

$(8+3i)(8+3i)$

$64+24i+24i+9i^2$

$64+48i+9(-1)$

$55+48i$

$(2 + 3i)(2 - 3i)$

$4 - 6i + 6i - 9i^2$

$4 - 9(-1)$

$4+9$

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Rational No Square Roots No i's Irrational Has square Root No i's. Complex Has i	Solve Each Quadratic. Tell whether the solution is rational, irrational, or complex $x^2 - 5x + 10 = 0$ $\quad$ $x^2 + 4x + 2 = 0$ $-x^2 + 5x - 6 = 0$ $\quad$ $a^2 - 5a + 8 = 0$ $x^2 + 6x + 12 = 0$ $\quad$ $10x^2 - 11x + 9 = 13x - 6x^2$