Solve by Completing the Square

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

$+9 \quad +9$

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

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

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

$-1 \pm \sqrt{10}$

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

$-2x \quad -2x$

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

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

$\sqrt{44} = \sqrt{4} \cdot \sqrt{11}$

$2\sqrt{11}$

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

$x = 3 \pm \sqrt{44} \Rightarrow 3 \pm 2\sqrt{11}$

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

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

$\sqrt{(x-2)^2} = \sqrt{8}$

$\sqrt{8} = \sqrt{4} \cdot \sqrt{2}$

$2\sqrt{2}$

$x - 2 = \pm\sqrt{8}$

$x = 2 \pm \sqrt{8}$ $\quad 2 \pm 2\sqrt{2}$

B $x^2 + 3x + 15 = 0$

4. $\frac{-15}{1} + \frac{1}{4}$ (·4)

$\frac{-60}{4} + \frac{1}{4} = \frac{-51}{4}$

$x^2 + 3x + \frac{9}{4} = -15 + \frac{1}{4}$

$\sqrt{(x + \frac{3}{2})^2} = \sqrt{-\frac{51}{4}}$

$x + \frac{3}{2} = \pm\sqrt{\frac{-51}{4}}$

$x = -\frac{3}{2} + \sqrt{\frac{-51}{4}}$

$-\frac{3}{2} \pm \frac{\sqrt{51}}{2} i$

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

$\sqrt{(x-6)^2} = \sqrt{64}$ (+36)

$x - 6 = \pm 8$

$x = 6 \pm 8$

$6 + 8 = 14$

$6 - 8 = -2$

$x^2 + 5x + 7 = 3x$

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

$x^2 + 2x + 1 = -7 + 1$

$\sqrt{(x+1)^2} = \sqrt{-6}$

$x + 1 = \pm\sqrt{-6}$

$x = -1 \pm \sqrt{6}\, i$

$\frac{-3x^2}{-3} + \frac{18x}{-3} = \frac{27}{-3}$

$x^2 - 6x + 9 = -9$ (+9)

$(x-3)^2 = 0$

$x - 3 = 0$

$x = 3$

3 ± 0

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

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

$(x+4)^2 = 0$

$x + 4 = \pm\sqrt{0}$

$x + 4 = 0$

$x = -4$