

Solution to Problem #5:

$$6x^2 + 69x - 36 = 0$$

$$\frac{1}{6}(6x^2 + 69x - 36) = \frac{1}{6}(0)$$

$$x^2 + \frac{69}{6}x - 6 = 0$$

$$x^2 + \frac{69}{6}x - 6 + 6 = 0 + 6$$

$$x^2 + \frac{69}{6}x = 6$$

$$x^2 + \frac{69}{6}x + \left(\frac{\frac{69}{6}}{2}\right)^2 = 6 + \left(\frac{\frac{69}{6}}{2}\right)^2$$

$$x^2 + \frac{69}{6} + \frac{4761}{144} = 6 + \frac{4761}{144}$$

$$\left(x + \frac{69}{12}\right)^2 = \frac{5625}{144}$$

$$\sqrt{\left(x + \frac{69}{12}\right)^2} = \sqrt{\frac{5625}{144}}$$

$$x + \frac{69}{12} = \pm \frac{75}{12}$$

$$x + \frac{69}{12} - \frac{69}{12} = \pm \frac{75}{12} - \frac{69}{12}$$

$$x = \pm \frac{75}{12} - \frac{69}{12}$$

$$\begin{aligned}x_1 &= \frac{75}{12} - \frac{69}{12} \\ &= \frac{6}{12}\end{aligned}$$

$$\boxed{x_1 = \frac{1}{2}}$$

$$\begin{aligned}x_2 &= -\frac{75}{12} - \frac{69}{12} \\ &= -\frac{144}{12}\end{aligned}$$

$$\boxed{x_2 = -12}$$