Answers for Three Completing the Square Problems

1. $x^2 - 12x = -9$

$x^2 - 12x + 6^2 = -9 + 6^2$

$(x-6)^2 = 25$

$x - 6 = \pm 5$

$x = 6 \pm 5$

$x = 11 \text{ or } 1$

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2. $x^2 + 9x = -7$

$x^2 + 9x + \left(\frac{9}{2}\right)^2 = -7 + \left(\frac{9}{2}\right)^2$

$\left(x + \frac{9}{2}\right)^2 = \frac{53}{4}$

$x + \frac{9}{2} = \pm\sqrt{\frac{53}{4}}$

$x = -\frac{9}{2} \pm \frac{\sqrt{53}}{2}$

$x = \frac{-9 \pm \sqrt{53}}{2}$

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3. $2x^2 + 8x = 20$

$2(x^2 + 4x) = 20$

$2(x^2 + 4x + 4) = 20 + 8$

$2(x+2)^2 = 28$

$(x+2)^2 = 14$

$x + 2 = \pm\sqrt{14}$

$x = -2 \pm \sqrt{14}$