solving quadratic equations by factoring

example: solve $x^2 - 5x = 24$

$$x^2 - 5x - 24 = 0$$

$$x^2 - 5x - 24 = (x - 8)(x + 3) = 0$$

$$x - 8 = 0 \quad \text{and} \quad x + 3 = 0$$

$$\Longrightarrow \; x = 8 \quad \text{and} \quad \Longrightarrow \; x = -3$$

$$8^2 - 5(8) = 64 - 40 = 24 \Longrightarrow \textit{true}$$
$$(-3)^2 - 5(-3) = 9 - (-15) = 24 \Longrightarrow \textit{true}$$

Exercise 3.

solving quadratic equations by factoring

step by step for solving a quadratic equation by factoring

1. write the equation in standard form.
2. factor the quadratic completely
3. set each factor containing a variable equal to 0
4. solve the resulting equations
5. check each solution in the original equation

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$$x - 8 = 0 \quad \text{and} \quad x + 3 = 0$$

$$\implies x = 8 \quad \text{and} \quad \implies x = -3$$

$$8^2 - 5(8) = 64 - 40 = 24 \implies \textit{true}$$
$$(-3)^2 - 5(-3) = 9 - (-15) = 24 \implies \textit{true}$$

Exercise 3. $4x(8x + 9) = 5$

modular arithmetic