Section P.4
Part 1

Solving Equations Algebraically

Objective: Given a quadratic equation, students will find its solution(s) and check the solution(s).

Study Problems

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Example

Solve by factoring.

a. $16x^2 - 4x = 0$

a) $4x(4x-1) = 0$

$4x = 0$ $\qquad$ $4x - 1 = 0$

$x = 0$ $\qquad$ $x = \frac{1}{4}$

b. $9x^2 - 1 = 0$

$(3x - 1)(3x + 1) = 0$

$x = \frac{1}{3}$ $\qquad$ $x = -\frac{1}{3}$

c. $2x^2 - 11x - 6 = 0$

c) $(2x + 1)(x - 6) = 0$

$2 \cdot 1$ $\qquad$ $6 \cdot 1$ $\qquad$ $\frac{1x}{-12x}$

$\qquad$ $\qquad$ $\qquad$ $= -11x$

$x = -\frac{1}{2}$, $x = 6$

Example

Solve by completing the square.

a. $2x^2 - 8x + 9 = 0$

$2(x^2 - 4x + 4) = -9 + 2(4)$

$\left(\frac{-4}{2}\right)^2$

-2^2

4

$2(x-2)^2 = -1$

$\frac{2(x-2)^2}{2} = \frac{-1}{2}$

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

$x - 2 = \pm i \sqrt{\frac{1}{2}}$

$x = 2 \pm i \sqrt{\frac{1}{2}}$

$x = 2 \pm \frac{i\sqrt{2}}{2}$

b. $3x^2 - 12x + 8 = 0$