Bell Work

Find the zeros by factoring.

$$f(x) = x^2 + 10x + 25$$

Solving a Polynomial Equation by Factoring

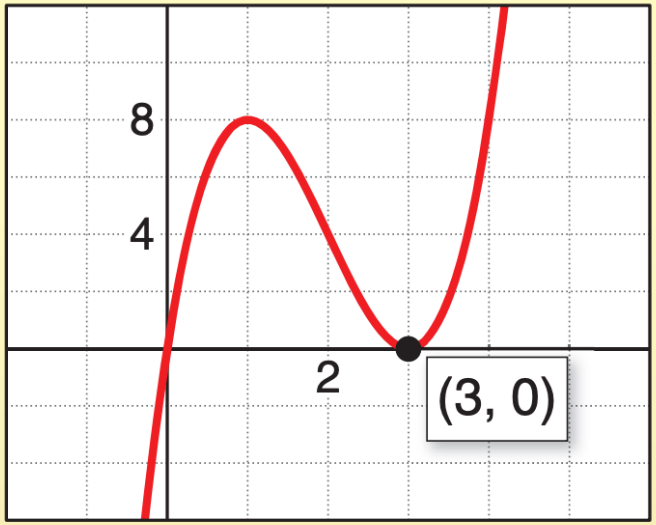
Solve the equation.

$$2x^3 - 12x^2 + 18x = 0$$

In Example 1, the factor $x - 3$ appears more than once. This creates a **repeated solution** of $x = 3$. Note that the graph of the related function touches the x-axis (but does not cross the x-axis) at the repeated zero $x = 3$, and crosses the x-axis at the zero $x = 0$. This concept can be generalized for a polynomial function f as follows.

- When a factor $x - k$ of $f(x)$ is raised to an odd power, the graph of f *crosses* the x-axis at $x = k$.
- When a factor $x - k$ of $f(x)$ is raised to an even power, the graph of f *touches* the x-axis (but does not cross the x-axis) at $x = k$.

Check



Solving a Polynomial Equation by Factoring

Solve the equation.

$$4x^4 - 40x^2 + 36 = 0$$

Solving a Polynomial Equation by Factoring

Solve the equation.

$$-3n^3 + 24n^2 - 48n = 0$$

Find the Zeros of a Polynomial

Find the zeros then sketch the graph.

$$f(x) = -2x^4 + 16x^2 - 32$$

Find the Zeros of a Polynomial

Find the zeros then sketch the graph.

$$f(x) = x^3 + x^2 - 6x$$

Find the Zeros of a Polynomial

Find the zeros then sketch the graph.

$$f(x) = -x^3 - 2x^2 + 9x + 18$$

Find the Zeros of a Polynomial

Find the zeros then sketch the graph.

$$f(x) = 3x^4 - 6x^2 + 3$$