

Self-Check for Tutorial 13

Generating Equations for Given Roots

Find a polynomial equation with the given roots. Use your graphing calculator to graph the polynomial equation and verify that the equation has the given roots.

1. $-3, 5$

2. $-\frac{3}{4}, 0$

3. $0, 1, -2$

4. $-3, \frac{2}{3}, -\frac{1}{2}$

5. $-1, -\sqrt{3}, \sqrt{3}$

6. $-2\sqrt{2}, 2\sqrt{2}, \frac{1}{5}$

Solutions to Self-Check for Tutorial 13

Generating Equations for Given Roots

Find a polynomial equation with the given roots. Use your graphing calculator to graph the polynomial equation and verify that the equation has the given roots.

1. $-3, 5$

$$f(x) = (x + 3)(x - 5)$$

$$f(x) = x^2 - 5x + 3x - 15$$

$$f(x) = x^2 - 2x - 15$$

Does your graph cross the x-axis at $(-3, 0)$ and $(5, 0)$?

3. $0, 1, -2$

$$f(x) = x(x - 1)(x + 2)$$

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

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

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

Does your graph cross the x-axis at $(0, 0)$, $(1, 0)$, and $(-2, 0)$?

5. $-1, -\sqrt{3}, \sqrt{3}$

$$f(x) = (x + 1)(x + \sqrt{3})(x - \sqrt{3})$$

$$f(x) = (x + 1)(x^2 - \sqrt{3}x + \sqrt{3}x - 3)$$

$$f(x) = (x + 1)(x^2 - 3)$$

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

Does your graph cross the x-axis at $(-1, 0)$, $(-\sqrt{3}, 0)$, and $(\sqrt{3}, 0)$?

2. $-\frac{3}{4}, 0$

$$f(x) = x\left(x + \frac{3}{4}\right)$$

$$f(x) = x(4x + 3)$$

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

Does your graph cross the x-axis at $(-\frac{3}{4}, 0)$ and $(0, 0)$?

4. $-3, \frac{2}{3}, -\frac{1}{2}$

$$f(x) = (x + 3)(3x - 2)\left(x + \frac{1}{2}\right)$$

$$f(x) = (x + 3)(3x - 2)(2x + 1)$$

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

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

$$f(x) = 6x^3 - x^2 - 2x + 18x^2 - 3x - 6$$

$$f(x) = 6x^3 + 17x^2 - 5x - 6$$

Does your graph cross the x-axis at $(-3, 0)$, $(\frac{2}{3}, 0)$, and $(-\frac{1}{2}, 0)$?

6. $-2\sqrt{2}, 2\sqrt{2}, \frac{1}{5}$

$$f(x) = (x + 2\sqrt{2})(x - 2\sqrt{2})\left(x - \frac{1}{5}\right)$$

$$f(x) = (x + 2\sqrt{2})(x - 2\sqrt{2})(5x - 1)$$

$$f(x) = (x^2 - 2\sqrt{2}x + 2\sqrt{2}x$$

$$- 4\sqrt{2}^2)(5x - 1)$$

$$f(x) = (x^2 - 4\sqrt{2}^2)(5x - 1)$$

$$f(x) = (x^2 - 8)(5x - 1)$$

$$f(x) = 5x^3 - x^2 - 40x + 8$$

Does your graph cross the x-axis at $(-2\sqrt{2}, 0)$, $(2\sqrt{2}, 0)$, and $(\frac{1}{5}, 0)$?