QuickCheck

Use the related graph of each equation to determine its roots. If exact roots cannot be found, state the consecutive integers between which the roots are located.

1. $x^2 - 4x + 1 = 0$ **between 0 and 1, and between 3 and 4**
2. $2x^2 + x - 6 = 0$ $\frac{3}{2}$ **and** -2
3. **PHYSICS** Allie drops a ball from the top of a 30-foot building. How long does it take for the ball to reach the ground, assuming there is no air resistance? Use the formula $h(t) = -16t^2 + h_0$, where t is the time in seconds and the initial height h_0 is in feet. **between 1 and 2 seconds**

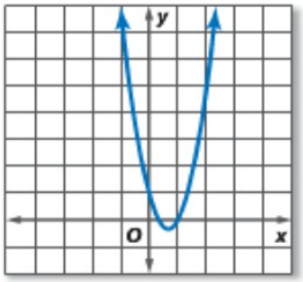
Simplify each expression by using synthetic division.

4. $(5x^2 - 22x - 15) \div (x - 5)$ $5x + 3$
5. $(3x^2 + 14x - 12) \div (x + 4)$ $3x + 2 - \frac{20}{x+4}$
6. $(2x^3 - 7x^2 - 36x + 36) \div (x - 6)$ $2x^2 + 5x - 6$
7. $(3x^4 - 13x^3 + 17x^2 - 18x + 15) \div (x - 3)$
8. **FINANCE** The number of specialty coffee mugs sold at a coffee shop can be estimated by $n = \frac{4000x^2}{x^2 + 50}$, where x is the amount of money spent on advertising in hundreds of dollars and n is the number of mugs sold.
   a. Perform the division indicated by $\frac{4000x^2}{x^2 + 50}$. $4000 - \frac{200{,}000}{x^2 + 50}$
   b. About how many mugs will be sold if \$1000 is spent on advertising? **about 2667**

QuickReview

Example 1 (Used in Lesson 6-2)

Use the related graph of $0 = 3x^2 - 4x + 1$ to determine its roots. If exact roots cannot be found, state the consecutive integers between which the roots are located.



The roots are the x-coordinates where the graph crosses the x-axis.

The graph crosses the x-axis between 0 and 1 and at 1.

Example 2 (Used in Lessons 6-4 through 6-6)

Simplify $(3x^4 + 4x^3 + x^2 + 9x - 6) \div (x + 2)$ by using synthetic division.

$x - r = x + 2$, so $r = -2$.

-2	3	4	1	9	-6
	↓	-6	4	-10	2
	3	-2	5	-1	-4

The result is $3x^3 - 2x^2 + 5x - 1 - \frac{4}{x+2}$.

7. $3x^3 - 4x^2 + 5x - 3 + \frac{6}{x-3}$