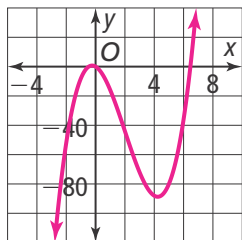# 3-5 Additional Practice

Zeros of Polynomial Functions
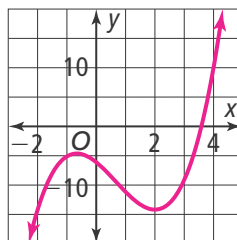
Sketch the graph of the function by finding the zeros. List the zeros.

1. $f(x) = 2x^3 - 12x^2 - 6x$

$x = 0, x = 3 \pm 2\sqrt{3}$

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

$x = 3.6, x = -0.8 \pm 1.02i$

Find the zeros of each function and describe the behavior of the graph of the function at each zero.

3. $x^3 - 8x^2 + 18x$ $x = 0, 3, 6$

the graph crosses the
x-axis at 0

4. $x^3 + x^2 - 3x + 1$

$x = 1, -1 + \sqrt{2}, -1 - \sqrt{2}$

the graph crosses the x-axis
at 1, 0.4, −2.4

Determine all the real and complex zeros of each polynomial function.

5. $f(x) = x^3 - 7x^2 + 4x - 28$

$x = 7, 2i, -2i,$

6. $f(x) = x^3 - x^2 - 2x + 8$

$x = -2, \dfrac{3 \pm i\sqrt{7}}{2}$

7. A company that sells toys models their profit with the function
$P(x) = -4x^3 + 32x^2 - 64$. Their profit P, in thousands of dollars,
is a function of the number of toys sold x measured in hundreds.
What do the key features of the graph reveal about the profits?
What is the maximum profit the company can make?

The domain > 0; zeros: 1.58, 7.73; To earn a profit, the
company should make between 1,580 and 7,730 toys.
The maximum profit the company can make is $29,338.

Solve each inequality.

8. $x^3 - 27x < 0$ $x < 3$

9. $x^3 + 9x^2 - 10x > 0$ $x < 0; x > 1$

10. Use your graphing calculator to determine if $f(x) = (x - 1)(x - 6)(x + 3)$
is the correct factorization of $f(x) = x^3 + 7x^2 + 4x - 12$. Explain.

The zeroes for $f(x) = x^3 + 7x^2 + 4x - 12$ are $x = -6, -2, 1$, so
the correct factorization of the equation is $(x + 6)(x + 2)(x + 1)$.