✎ Test 17 (Lessons 33–34): Shapes of Polynomial Functions

Determine if the equation is a polynomial function. If so, state the end behavior.

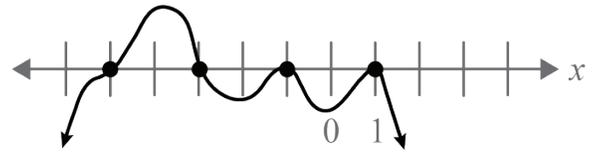**1)** $y = \dfrac{6}{5}x^2(2x+3)^4$

2) $y = \sqrt{x} + x\sqrt{2}$

For problems 3–4, use the polynomial $f(x) = 2x^4 + x^3 - 19x^2 - 9x + 9.$

3) Name all possible rational roots for the polynomial.

4) Determine the exact roots. Write the answer as a product of its factors.

5) Write a possible equation of the polynomial function as the product of factors.

For problems 6–7, use the equation $x^3 + 4x^2 - 3x - 2 = 0$.

6) Find all zeros.

7) Sketch your answer from problem 6.

For problems 8–9, use the polynomial function $q(x) = \dfrac{1}{3}x(x-7)^3(x+5)^2$.

8) Describe the multiplicities of the equation.

9) Describe the end behavior of the equation. Explain.

10) Sketch the roots of a polynomial function. Name the degree.

$a < 0$

$x = -2$, multiplicity 2

$x = 1$, multiplicity 3

$x = 3$, multiplicity 2

$\xleftrightarrow{\hspace{5cm}} x$