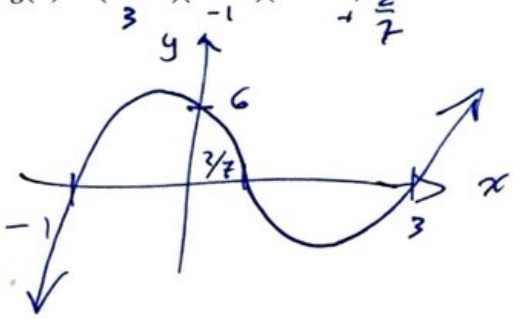
Illustrative Mathematics

Solutions

Lesson 10 Practice Problems

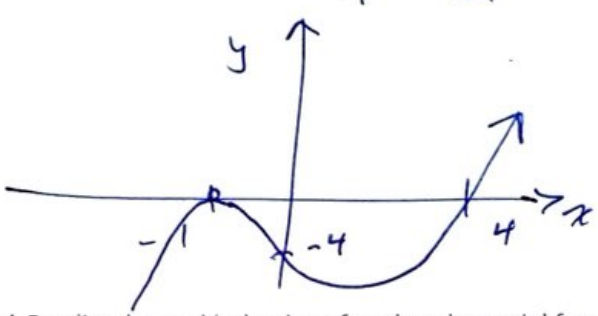
1. Draw a rough sketch of the graph of $g(x) = (x-3)(x+1)(7x-2)$.

3 -1 +2/7



2. Draw a rough sketch of the graph of $f(x) = (x+1)^2(x-4)$.

-1 +4



3. *Technology required.* Predict the end behavior of each polynomial function, then check your prediction using technology.

a. $A(x) = (x+3)(x-4)(3x-7)(4x-3)$

x^4

$x \to +\infty, y \to +\infty$

$x \to -\infty, y \to +\infty$

b. $B(x) = (3-x)^2(6-x)$

$-x^3$

$x \to +\infty, y \to -\infty$

$x \to -\infty, y \to +\infty$

c. $C(x) = -(4-3x)(x^4)$

$+x^5$

$x \to +\infty, y \to +\infty$

$x \to -\infty, y \to -\infty$

d. $D(x) = (6-x)^6$

$+x^6$

$x \to +\infty, y \to +\infty$

$x \to -\infty, y \to +\infty$

4. Which term can be added to the polynomial expression $5x^7 - 6x^6 + 4x^4 - 4x^2$ to make it into a 10th degree polynomial?

A. 10

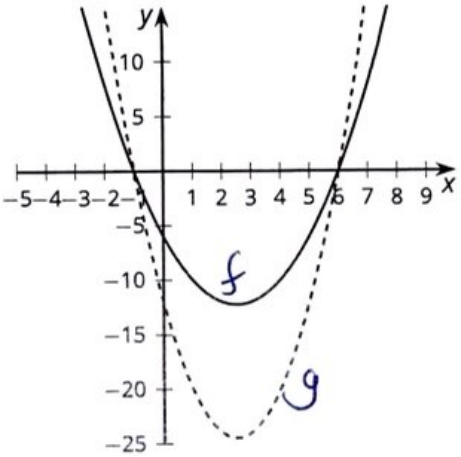
B. $5x^3$

C. $5x^7$

D. x^{10}

(From Unit 2, Lesson 3.)

5. $f(x) = (x + 1)(x - 6)$ and $g(x) = 2(x + 1)(x - 6)$. The graphs of each are shown.



a. Which graph represents which polynomial function? Explain how you know.

g has a leading factor of two, so it has twice the amplitude

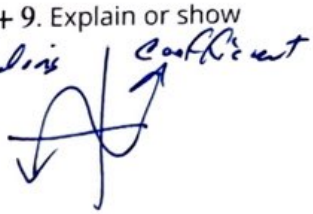
(From Unit 2, Lesson 6.)

6. State the degree and end behavior of $f(x) = 8x^3 + 2x^4 - 5x^2 + 9$. Explain or show your reasoning.

Degree 3, positive leading coefficient

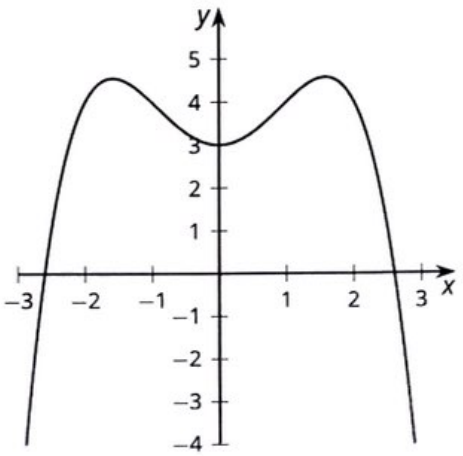
$x \to +\infty$, $y \to +\infty$

$x \to -\infty$, $y \to -\infty$



(From Unit 2, Lesson 8.)

7. The graph of a polynomial function f is shown. Select **all** the true statements about the polynomial.



A. The degree of the polynomial is even.

B. The degree of the polynomial is odd.

C. The leading coefficient is positive.

D. The leading coefficient is negative.

E. The constant term of the polynomial is positive.

F. The constant term of the polynomial is negative.

(From Unit 2, Lesson 9.)