Name: Key

Chapter 6 Review

Simplify the expression.

1. $(3x^2y^6)^3$

$27x^6y^{18}$

2. $x^7 \cdot \frac{1}{x^2}$

x^5

3. $\frac{-63xy^9}{18x^{-2}y^3}$

$\frac{-7x^3y^6}{2}$

4. $\frac{15x^2y}{6x^4y^5} \cdot \frac{6x^3y^2}{5xy}$

$\frac{3}{y^3}$

Perform the indicated operation.

5. $(3x^2 - 5x + 7) - (2x^2 + 9x - 1)$

$x^2 - 14x + 8$

6. $(2x - 3)(5x^2 - x + 6)$

$10x^3 - 17x^2 + 15x - 18$

7. $(x - 4)(x + 1)(x + 3)$

$x^3 - 13x - 12$

Divide using long division.

8. $(8x^4 + 5x^3 + 4x^2 - x + 7) \div (x + 1)$

$8x^3 - 3x^2 + 7x - 8 + \frac{15}{x+1}$

Divide using synthetic division.

9. $(12x^3 + 31x^2 - 17x - 6) \div (x + 3)$

$12x^2 - 5x - 2$

Factor the polynomial completely.

10. $64x^3 + 343$

$(4x+7)(16x^2-28x+49)$

11. $2x^3 - 3x^2 + 4x - 6$

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

12. $x^4 + 8x^2 - 9$

$(x^2+9)(x-1)(x+1)$

Factor the polynomial function. Then list the zeros.

13. $f(x) = x^3 - 5x^2 - 14x$

$f(x) = x(x+2)(x-7)$

zeros: $0, -2, 7$

14. $f(x) = x^4 + x^3 - 2x^2 + 4x - 24$

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

zeros: $-3, 2, -2i, 2i$

Write a polynomial function of least degree that has real coefficients, the given zeros and a leading coefficient of 1.

15. 1, -3, 4

$f(x) = x^3 - 2x^2 - 11x + 12$

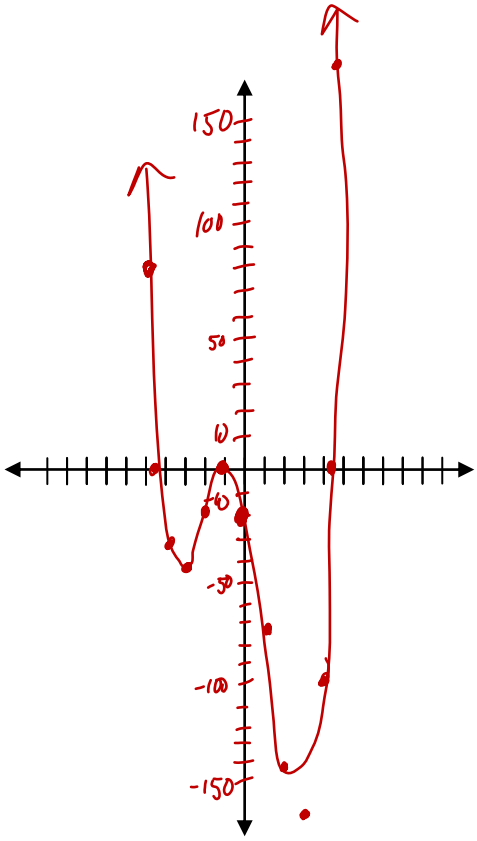
16. -4, 5, 2i

$f(x) = x^4 - x^3 - 16x^2 - 4x - 80$

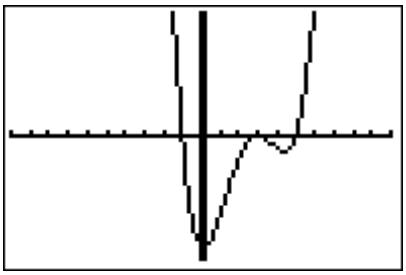
Graph the polynomial.

17. $f(x) = x^4 + 2x^3 - 19x^2 - 40x - 20$

zeros: $-1, -1, -2\sqrt{5}, 2\sqrt{5}$



Write the equation of the polynomial in standard form.

18. 

$f(x) = x^4 - 10x^3 + 28x^2 - 6x - 45$

Use finite differences and a system of equations to find a polynomial function that fits the data.

19.

x	1	2	3	4	5	6
y	-2	1	-4	-5	10	53

$f(x) = 2x^3 - 16x^2 + 37x - 25$