Algebra 2CP
Chapter 6 YOU CAN...

✤ Use the properties of exponents

1. $(-5x^4y^3)(-3xy^5)$
2. $(-2r^2s)^3(3rs^2)$
3. $\left(\frac{8a^3b^2}{16a^2b^3}\right)^4$

✤ Simplify expressions containing negative exponents

4. $\frac{12x^{-3}y^{-2}z^{-8}}{30x^{-6}y^{-4}z^{-1}}$
5. $\left(\frac{4x^{-3}y^2}{xy^{-5}}\right)^{-2}$

✤ Write numbers in scientific notation. Multiply and divide numbers written in scientific notation and simplify the result, expressing the answer in scientific notation.

6. $(8.95 \times 10^9)(1.82 \times 10^7)$
7. $(3.1 \times 10^5)(7.9 \times 10^{-8})$
8. $\frac{(2.38 \times 10^{13})(7.56 \times 10^{-5})}{(4.2 \times 10^{18})}$

✤ Divide polynomials by monomials.

9. $\frac{9a^3b^2 - 18a^2b^3}{3a^2b}$
10. $(5ab^2 - 4ab + 7a^2b)(ab)^{-1}$

✤ Divide using long division and synthetic division. (Show both methods for each problem.)

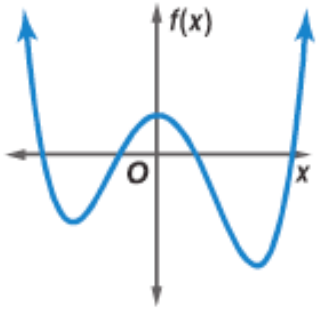
11. $(x^4 + 7x^3 + 10x^2 + 3x) \div (x + 3)$
12. $(16x^4 - 60x^3 - 28x^2 + 56x - 32)(x - 4)^{-1}$

✤ Evaluate function values of variables.

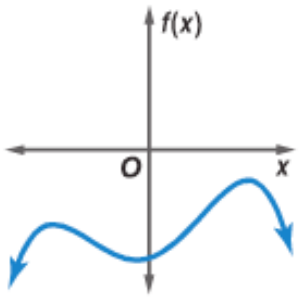
13. $p(x) = 2x^3 - 1; p(-4)$
14. $p(x) = 3x^2 - 2x + 5; 2[p(x + 4)]$

✤ Graph polynomial functions. For each graph, (a) describe the end behavior, (b) determine whether it represents an odd-degree or an even-degree polynomial function, and (c) state the number of real zeros.

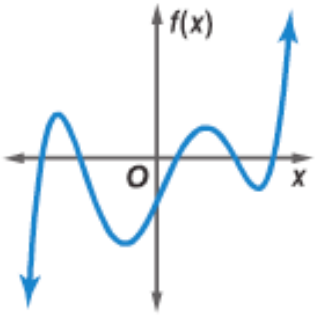
15.



16.



17.



✤ Sketch graphs of polynomial functions.

18. $f(x) = x^3 + x^2 - 3x$
19. $f(x) = x^4 - 4x^2$

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✤ Factor each polynomial completely.

20. $ab - 5a + 3b - 15$

21. $c^3 - 216$

22. $4y^3 + 24y^2 + 36y$

23. $25a^4 - 16b^2$

24. $3m^2 + m - 4$

25. $10a^3 - 20a^2 - 2a + 4$

✤ Solve polynomial equations.

26. $3x^3 + 4x^2 - 15x = 0$

27. $m^4 + 3m^3 = 40m^2$

28. $x^4 - 8x^2 + 16 = 0$

29. $a^3 - 64 = 0$

✤ Expand binomials using Pascal's Triangle.

30. $(x + 2y)^6$

31. $(2s - 3t)^5$

✤ Solve word problems.

32. Earth is an average of 1.5 x 10^{11} meters from the Sun. Light travels at 3 x 10^8 meters per second. About how long does it take sunlight to reach Earth?

33. For a moving object with mass *m* in kilograms, the kinetic energy *KE* in joules is given by the function $KE(v) = 0.5mv^2$, where *v* represents the speed of the object in meters per second. Find the kinetic energy of an all-terrain vehicle with a mass of 171 kilograms moving at a speed of 11 meters per second.

34. Jill is designing a picture frame for an art project. She plans to have a square piece of glass in the center and surround it with a decorated ceramic frame, which will also be a square. The dimensions of the glass and frame are shown in the diagram at the right. Jill determines that she needs 27 square inches of material for the frame.
    (a) Write a polynomial equation that models the area of the frame.
    (b) Find the dimensions of the glass piece and the frame.