Name _____ Class _____ Date _____

5-1 Practice

Form G

Polynomial Functions

Write each polynomial in standard form. Then classify it by degree and by number of terms.

1. $4x + x + 2$
2. $-3 + 3x - 3x$
3. $6x^4 - 1$
4. $1 - 2s + 5s^4$
5. $5m^2 - 3m^2$
6. $x^2 + 3x - 4x^3$
7. $-1 + 2x^2$
8. $5m^2 - 3m^3$
9. $5x - 7x^2$
10. $2 + 3x^3 - 2$
11. $6 - 2x^3 - 4 + x^3$
12. $6x - 7x$
13. $a^3(a^2 + a + 1)$
14. $x(x + 5) - 5(x + 5)$
15. $p(p - 5) + 6$
16. $(3c^2)^2$
17. $-(3 - b)$
18. $6(2x - 1)$
19. $\frac{2}{3} + s^2$
20. $\frac{2x^4 + 4x - 5}{4}$
21. $\frac{3 - z^5}{3}$

Determine the end behavior of the graph of each polynomial function.

22. $y = 3x^4 + 6x^3 - x^2 + 12$
23. $y = 50 - 3x^3 + 5x^2$
24. $y = -x + x^2 + 2$
25. $y = 4x^2 + 9 - 5x^4 - x^3$
26. $y = 12x^4 - x + 3x^7 - 1$
27. $y = 2x^5 + x^2 - 4$
28. $y = 5 + 2x + 7x^2 - 5x^3$
29. $y = 20 - 5x^6 + 3x - 11x^3$
30. $y = 6x + 25 + 4x^4 - x^2$

Describe the shape of the graph of each cubic function by determining the end behavior and number of turning points.

31. $y = x^3 + 4x$
32. $y = -2x^3 + 3x - 1$
33. $y = 5x^3 + 6x^2$

Determine the degree of the polynomial function with the given data.

34.

x	y
−2	−16
−1	1
0	4
1	5
2	16

35.

x	y
−2	52
−1	6
0	2
1	4
2	48

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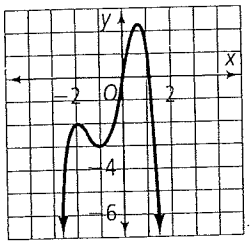
Name _____ Class _____ Date _____

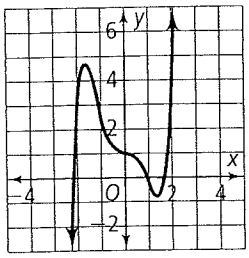
5-1 Practice (continued)

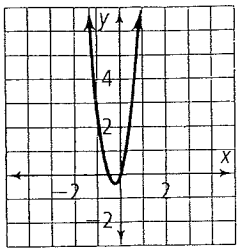
Form G

Polynomial Functions

Determine the sign of the leading coefficient and the degree of the polynomial function for each graph.

36. 

37. 

38. 

39. **Error Analysis** A student claims the function $y = 3x^4 - x^3 + 7$ is a fourth-degree polynomial with end behavior of down and down. Describe the error the student made. What is wrong with this statement?

40. The table at the right shows data representing a polynomial function.
    a. What is the degree of the polynomial function?
    b. What are the second differences of the y-values?
    c. What are the differences when they are constant?

x	y
−3	−999
−2	−140
−1	−7
0	0
1	1
2	116
3	945

Classify each polynomial by degree and by number of terms. Simplify first if necessary.

41. $4x^5 - 5x^2 + 3 - 2x^2$

42. $b(b - 3)^2$

43. $(7x^2 + 9x - 5) + (9x^2 - 9x)$

44. $(x + 2)^3$

45. $(4s^4 - s^2 - 3) - (3s - s^2 - 5)$

46. 13

47. **Open-Ended** Write a third-degree polynomial function. Make a table of values and a graph.

48. **Writing** Explain why finding the degree of a polynomial is easier when the polynomial is written in standard form.

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