Name_____ Class_____ Date_____

5-1 Practice

Form K

Polynomial Functions

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

1. $4x^3 - 3 + 2x^2$

To start, write the terms of the polynomial with their degrees in descending order. $4x^3 + 2x^2 - 3$

2. $8 - x^5 + 9x^2 - 2x$

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

4. $-6x^3$

5. $3 + 24x^2$

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

6. $y = 5x^3 - 2x^2 + 1$

7. $y = 5 - x + 4x^2$

8. $y = x - x^2 + 10$

9. $y = 3x^2 + 9 - x^3$

10. $y = 8x^2 - 4x^4 + 5x^7 - 2$

11. $y = 20 - x^5$

12. $y = 1 + 2x + 4x^3 - 8x^4$

13. $y = 15 - 5x^6 + 2x - 22x^3$

14. $y = 3x + 10 + 8x^4 - x^2$

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

15. $y = x^3 + 2x$

To start, make a table of values to help you sketch the middle part of the graph.

x	*y*
–2	–12
–1	–3
0	0
1	3
2	12

16. $y = -3x^3 + 4x^2 - 1$

17. $y = 4x^3 + 2x^2 - x$

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

18.

x	*y*
–3	–43
–2	–10
–1	1
0	2
1	5
2	22
3	65

19.

x	*y*
–3	65
–2	5
–1	–5
0	–1
1	5
2	25
3	95

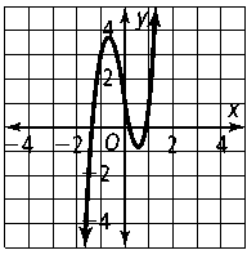
Name_____ Class_____ Date_____

5-1 Practice (continued) *Form K*

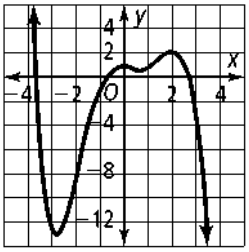
Polynomial Functions

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

20.



21.



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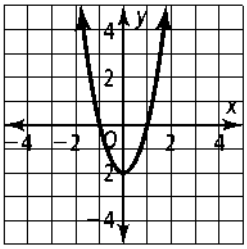

23. Error Analysis A student claims the function $y = -2x^3 + 5x - 7$ is a 3rd degree polynomial with ending behavior of down and up. Describe the error the student made. What is wrong with this statement?

24. The table to 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	98
−2	20
−1	6
0	2
1	2
2	48
3	230

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

25. $3x^5 - 6x^2 - 5 + x^2$

26. $a - 2a + 3a^2$

27. $(5x^2 + 2x - 8) + (5x^2 - 4x)$

28. $c^3(5 - c^2)$

29. $(5s^3 - 2s^2) - (s^4 + 1)$

30. $x(3x)(x + 2)$

31. $(2s - 1)(3s + 3)$

32. 5

33. Open-Ended Write a fourth-degree polynomial function. Make a table of values and a graph.