Chapter 5 Review

Directions: Write each polynomial in standard form. Then, classify by degree and number of terms.

1. $-9v^2 - 4v - v^4$	2. $-3 + 9x^3 + x^4 + 2x$
3. 5	4. $2(x^3 + 1) - x^2$

Directions: Describe the end behavior of each function. Then draw a sketch of what the function could look like using the end behavior and number of turns.

5. $f(x) = 2x^2 + 12x + 15$	6. $f(x) = -x^3 + 14x^2 - 64x + 97$
7. $f(x) = 3x^7 + 6$	8. $f(x) = -x^4 + 6x + 2$

Directions: Factor the following completely.

9. $x^3 - x^2 - 20x = 0$	10. $x^3 - 5x^2 - 3x + 15 = 0$

11. $x^4 - 5x^2 + 4 = 0$	12. $x^4 - 5x^2 - 6 = 0$
13. $x^3 + 64 = 0$	14. $x^3 - 125 = 0$

Directions: State the zeros and their multiplicities. Then graph the function.

15. $f(x) = (x - 1)^2 (x + 4)^3$	16. $f(x) = -x(x - 3)(x + 3)^2$
17. $f(x) = -(x + 1)(x - 2)(x + 4)$	18. $f(x) = (x + 1)(x - 2)$

Directions: Divide using any method.

19. $(x^3 - 3x^2 - 16x - 72) \div (x - 7)$	20. $(4x^3 - 28x^2 - 63x - 82) \div (x - 9)$
21. $(x^3 - 5x - 7) \div (x + 1)$	22. $(4x^3 + x - 2) \div (x + 2)$

Directions: State the possible rational roots for the following polynomials.

23. $f(x) = 5x^3 - 17x^2 + 213x - 2$	24. $f(x) = 3x^7 + 12x^4 + 2x^2 - 12$

Directions: Write a function in standard form with the following degrees and zeros.

25. A quartic function with its only real zeros at $x = -3$ and $x = 2$	26. A cubic function with zeros at $x = 3i$ and $x = -1$
27. A quartic function with zeros at $x = 3$, $x = -4$ and $x = \sqrt{5}$	28. A quartic function with its only real zeros at $x = 4$ and $x = 6$

Directions: Find all zeros.

29. $f(x) = 5x^3 - 4x^2 - x$	30. $f(x) = 3x^4 + 5x^3 + 3x^2 + 5x$
31. $f(x) = 3x^3 + 6x^2 - 19x - 30$	32. $f(x) = 2x^3 - 11x^2 + 20x - 11$

Directions: Use the table to determine the degree of the function.

33.

X	-3	-2	-1	0	1	2	3
Y	129	34	1	-6	1	34	129

34.

X	-3	-2	-1	0	1	2	3
Y	28	19	8	1	4	23	64

Directions: Determine the cubic function that is obtained from the parent function $y = x^3$ after each sequence of transformations.

35. A vertical stretch by a factor of 2; a vertical translation 5 units down; and a horizontal translation 3 units left.	36. A reflection across the x-axis; a vertical translation 6 units up; and a horizontal translation 4 units right
37. A vertical compression of a factor of ½ ; a vertical translation 5 units down; a horizontal translation 2 units left; and a reflection across the y-axis	38. A reflection across the y-axis; a vertical stretch by a factor of 3; and a vertical translation 2 units up

Directions: Find all the real zeros for the following.

39. $y = 3(x - 1)^3 + 2$	40. $y = 5(-x + 1)^3 + 10$