Name _____ Class _____ Date _____

Chapter Test Form A

Chapter 6

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

1. $4x^4 + 6x^3 - 2 - x^4$ **2.** $9x^2 - 2x + 3x^2$ **3.** $4x(x - 5)(x + 6)$

4. **Estimated Number of Deaths in the United States**

Year	1960	1970	1980	1990	2000	2003
Deaths (millions)	1.71	1.92	1.99	2.15	2.40	2.42

Source: *www.infoplease.com*

a. Find a cubic function to model the data. (Let x = years after 1960.)

b. Estimate the deaths for the year 2006.

Solve each equation by graphing. Where necessary, round to the nearest hundredth.

5. $x^4 + 2x^2 - 1 = 0$ **6.** $-x^3 - 3x - 2 = 0$ **7.** $y = -x^4 + 4x^3 + 3 = 0$

8. $-x^3 + 3x + 4 = 0$ **9.** $x^4 + 2x - 3 = 0$ **10.** $-x^3 + 2x^2 + 1 = 0$

Write a polynomial function with rational coefficients in standard form with the given zeros.

11. 2, 3, 5 **12.** $-1, -1, 1$

13. $\sqrt{3}, 2i$ **14.** $2 - i, \sqrt{5}$

For each function, determine the zeros and their multiplicity.

15. $y = (x - 1)^2(2x - 3)^3$ **16.** $y = (3x - 2)^5(x + 4)^2$ **17.** $y = 4x^2(x + 2)^3(x + 1)$

Solve each equation.

18. $(x - 1)(x^2 + 5x + 6) = 0$ **19.** $x^3 - 10x^2 + 16x = 0$

20. $(x + 2)(x^2 + 3x - 40) = 0$ **21.** $x^3 + 3x^2 - 54x = 0$

Divide using long division.

22. $(2x^3 + 13x^2 + 17x + 10) \div (x + 5)$ **23.** $(3x^3 + 12x^2 + 12x + 48) \div (3x + 12)$

24. $(x^3 + 9x^2 + 26x + 24) \div (x + 4)$ **25.** $(2x^3 - 11x^2 + 2x + 15) \div (x + 1)$

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Chapter Test (continued) Form A

Chapter 6

Divide using synthetic division.

26. $(x^3 - 4x^2 + x - 5) \div (x + 2)$

27. $(2x^3 - 4x + 3) \div (x - 1)$

28. $(x^3 + 5x^2 - x + 1) \div (x + 2)$

29. $(3x^3 - x^2 + 2x - 5) \div (x - 1)$

Use the Rational Root Theorem to list all possible rational roots for each equation. Then find any actual roots.

30. $x^3 + 2x^2 + 3x + 6 = 0$

31. $x^4 - 7x^2 + 12 = 0$

32. Use synthetic division and the Remainder Theorem to find $P(-5)$ if $P(x) = -x^3 - 4x^2 + x - 2$.

Evaluate each expression.

33. $4!$

34. $\frac{8!}{6!2!}$

35. ${}_6C_3$

36. ${}_7P_2$

Indicate whether each situation involves a combination or a permutation. Then solve.

37. You must complete the following chores: take out the trash, wash the dishes, vacuum the carpet, clean your room, make your bed, feed the fish. In how many different ways can you do the chores?

38. Groups of five students must be formed to work on a project. In how many different ways can a group of five be chosen from a class of 12 students?

39. How many different three-meat sandwiches can be made from six choices of meats? (Assume that no meat can be used more than once in a sandwich.)

Use the Binomial Theorem or Pascal's Triangle to expand each binomial.

40. $(x + y)^4$

41. $(4 - 3x)^3$

42. $(2r + q)^5$

43. $(a + 4b)^3$

44. The probability of Joseph making a free throw basket is 0.6. Find the probability that he will make exactly four out of seven free throw shots in one game.