1.6 Zeros

Name_____ Date _____ Period _____

Without graphing, determine the number of zeros for each of the following polynomials.

1. $f(x) = 2x^2 - 8x + 6$

2. $f(x) = x^4 - 2x^2 - 5x + 6$

3. $f(x) = -x^3 - x^2 - 5x - 3$

4. $f(x) = x^5 - 3x$

Find the zeros of each polynomial.

5. $f(x) = (x+2)(x-2)(x-3)$

6. $f(x) = 3x(x+2)(5x-4)$

Write an equation in factored form for the function with the given zeros.

7. $x = 4, 7, -2$

8. $x = \frac{3}{4}, -5, 0, 4$

Write an equation in standard form for the function with the given zeros.

9. $x = 2, -3$

10. $x = \frac{2}{3}, -7$

Factor to find the zeros of each of the following polynomials.

11. $f(x) = x^2 + 3x - 10$

12. $f(x) = x^2 - 36$

13. $f(x) = 3x^2 - 7x - 6$

14. $f(x) = x^2 + 10x + 24$

For each of the given polynomials, determine which of the binomials listed are factors. Use synthetic division on #15 and the Remainder Theorem on #16. There may be more than one answer.

15. $f(x) = -2x^2 + 15x - 7$

    a) $x + 1$

    b) $x - 7$

16. $f(x) = x^3 + 3x^2 - 4x - 12$

    a) $x - 2$

    b) $x + 3$

Simplify.

17. $\sqrt{25}$

18. $\sqrt{12}$

19. $3\sqrt{50}$

20. $6\sqrt{25}$

21. $2 + 3\sqrt{45}$

22. $\dfrac{4 - \sqrt{20}}{6}$

Use the quadratic formula to find the zeros of each polynomial. Leave in radical form.

23. $f(x) = -5x^2 - 2x + 3$

24. $f(x) = 3x^2 + 6x - 13$

Simplify each of the following radicals.

25. $\sqrt{32}$

26. $\sqrt{-25}$

27. $\sqrt{-45}$

Simplify.

28. $(-6i)(-5i)$

29. $3(2i)(-4i)$

30. $(-2i)(2i)$

31. $(3+i)(5-2i)$

32. $(x-7i)(x+7i)$

33. $(x-3-2i)(x-3+2i)$

34. $(x-4-i)(x-4+i)$

Use the quadratic formula to find the zeros of each polynomial. Leave in radical form.

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

36. $f(x) = x^2 - 10x + 26$

Factor each expression over the complex numbers. Write your answer in factored form!

37. $f(x) = x^2 - 4x + 5$

38. $f(x) = x^2 + 9$

39. $f(x) = x^2 + 4x + 7$

40. $f(x) = x^2 + 64$

41. $f(x) = 2x^2 + 6x + 5$

42. $f(x) = 9x^2 - 6x + 5$