4.1

Name _____ Date _____ Period _____

Zeros

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

Find the zeros of each polynomial.

7. $f(x) = (x+2)(x-2)(x-3)$
8. $f(x) = 3x(x+2)(5x-4)$
9. $f(x) = (x+1)(2x-3)$

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

10. $x = 4, 7, -2$
11. $x = 5, 4, -8, -6$

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

12. $x = 2, -3$
13. $x = -5, -7$

Find the zeros for each polynomial. (Solve for x by factoring.)

14. $0 = x^2 + 3x - 10$
15. $x^2 - 36 = 0$
16. $3x^2 - 7x - 6 = 0$
17. $0 = x^2 + 10x + 24$

For each of the given polynomials, determine which of the binomials listed are factors by using the Remainder Theorem. There may be more than one answer. SHOW YOUR WORK!

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

a) $x + 1$

b) $x - 7$

c) $x - 2$

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

a) $x + 2$

b) $x - 2$

c) $x + 3$

Simplify.

20. $\sqrt{25}$

21. $\sqrt{12}$

22. $3 \pm \sqrt{45}$

Use the quadratic formula to find the zeros of each polynomial. HINT: $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

23. $f(x) = -4x^2 + 3x + 1$
$a =$ _____ $b =$ _____ $c =$ _____

24. $f(x) = x^2 - 2$
$a =$ ____ $b =$ _____ $c =$ _____

25. $f(x) = x^2 - 8x - 4$
$a =$ _____ $b =$ _____ $c =$ _____

26. $f(x) = 3x^2 + 6x - 13$
$a =$ _____ $b =$ _____ $c =$ _____

Find the zeros for each polynomial.

27. $f(x) = (x - 3)(x^2 + 2x - 15)$

28. $f(x) = x^3 - 49x$

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

30. $f(x) = 20x^3 - 45x$