4.3

Name _____ Date _____ Period _____

Complex Zeros

Simplify each of the following radicals. Show work if necessary.

1. $\sqrt{-1}$
2. $\sqrt{-25}$
3. $\sqrt{-72}$
4. $3\pm\sqrt{-45}$

Simplify. Show work if necessary.

5. $(-6i)(-5i)$
6. $3(2i)(-4i)$
7. $(-2i)(2i)$
8. $(5i)(5i)$
9. $(3+i)(5-2i)$
10. $(x-i)(x+i)$
11. $(x-4+i)(x-4-i)$
12. $(x-3+2i)(x-3-2i)$

Find the zeros of each polynomial. Then write the factored form of the polynomial. Show work!

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

    Factored Form:

    Zeros:

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

    Factored Form:

    Zeros:

15. Explain the shortcut to factor $f(x) = x^2 + 16$ without showing work. Then write the factored form.

Find the zeros using the quadratic formula. Show work! HINT: $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

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

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

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

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

Identify the zeros of the function and the x-intercepts of its graph. Write the polynomial in standard form. Show work!

20. $f(x) = (x - 3i)(x + 3i)$

Zeros:

x-intercepts:

Standard form:

21. $f(x) = (x - 1)(x + 1)(x + 2i)(x - 2i)$

Zeros:

x-intercepts:

Standard form:

Write a polynomial function of minimum degree in factored form with real coefficients whose zeros include those listed, find the degree of the polynomial (# of zeros) and identify the x-intercepts.

22. $1-2i$ and $1+2i$

Zeros:

x-intercepts:

Factored form:

23. $2, 3,$ and i

Zeros:

x-intercepts:

Factored form:

24. -2 and $1+2i$

Zeros:

x-intercepts:

Factored form:

25. -4 and $2i$

Zeros:

x-intercepts:

Factored form:

Write a polynomial function of minimum degree in factored form with real coefficients using the following information. Find the degree of the polynomial (# of zeros), the zeros and identify the x-intercepts.

26. 1 (multiplicity of 2), -2 (multiplicity of 3)

Degree:

Zeros:

x-intercepts:

Factored form:

27. 2 (multiplicity of 2), $3+i$ (multiplicity of 1)

Degree:

Zeros:

x-intercepts:

Factored form: