ALGEBRA II
Chapter 5 section 5, p. 362
Apply the Remainder and Factor Theorems

FOCUS:
If you know one zero of a polynomial function, how can you determine another zero?

VOCAB:
Polynomial Long Division: *a method used to divide polynomials similar to the way you divide numbers*

Synthetic Division: *a method used to divide polynomials by a divisor of the form* $x-k$

WARM – UP:

1. Use the quadratic formula to solve $2x^2 - 3x - 1 = 0$. Round to the nearest hundredth.

2. Use synthetic substitution to evaluate $f(x) = x^3 + x^2 - 3x - 10$ when $x = 2$. ______________________

3. A company's income is modeled by the function $P = 22x^2 - 571x$. What is the value of P when $x = 200$?

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NOTES:

Divide.

$f(x) = 3x^3 + 17x^2 + 21x - 11$ by $x + 3$

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

Divide using synthetic division. Set up the same as synthetic substitution, what is left underneath are the coefficients of your answer, with the last number being the remainder.

$f(x) = 2x^3 + 9x^2 + 14x + 5$ by $x - 3$

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

****In an instance where there is a term missing, in decreasing order of exponents you still have to put a 0 in for that coefficient*****

Factor ***completely*** using the given polynomial as a factor. (Means when you get an answer make sure the polynomials left can't be factored further!)

$f(x) = 2x^3 - 11x^2 + 3x + 36$ $x - 3$

$f(x) = x^3 - 6x^2 + 5x + 12$ $x - 4$

One zero of $f(x) = x^3 + x^2 - 16x - 16$ is 4. What is another zero of $f(x)$?