Warm-Up

Write a function with zeros of: 3, 5, -2

Write the polynomial in standard form:

$y = (x + 3)(x - 2)$

Write a function of minimum degree with given zeros and multiplicities:

1 with multi of 3

-3 with multi of 2

0 with multi of 1

8-3 Complex Zeros

- I can find all zeros of a polynomial including non-real complex zeros
- I can write a polynomial from its zeros

Fundamental Thm of Alg: an nth degree polynomial will have n complex zeros

(May be a combination of real and non-real complex.
Some zeros may be repeated)

Complex Conjugates: complex imaginary factors come in conjugate pairs

(if 3i is a zero, - 3i is also)

Odd functions will always have at least one real zero - why??

Find all zeros of $p(x) = x^3 - 125$. Include any multiplicities greater than 1.

First factor the difference of two cubes.

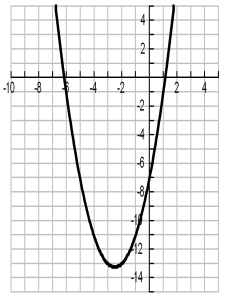
8-3

Find all zeros of $p(x) = x^4 - 256$. Include multiplicities greater than 1.

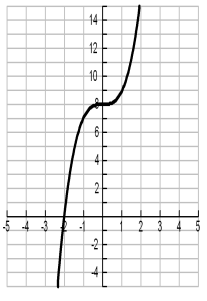
Find use factoring patterns to factor the polynomial.

How many complex zeros does each function have? How many are real? How many are non-real?

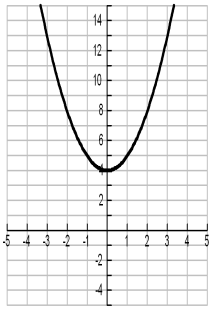
$x^2 + 5x - 7$



$x^3 + 8$



$x^2 + 4$



Linear Factorization Thm: a polynomial of nth degree has n linear factors

(some factors may be complex imaginary)

$$x^4 - 6x^3 + 10x^2 - 6x + 9$$
$$(x-3)(x+3)(x-i)(x+i)$$

Find all zeros and write a linear factorization of the following polynomial:

$x^4 + x^3 + 5x^2 - x - 6$

Write the following polynomial in standard form:

$$y = (x + 3i)(x - 3i)$$

Write a polynomial function of minimum degree with the following zeros:

4, 7, 2i

Write a polynomial function of minimum degree with the following zeros in standard form:

- 4, 2 + 3i

Write an equation of minimum degree with given zeros and multiplicities:

3 with multi of 2
5 + i with multi of 1

Use the given zero to find the remaining zeros and write a linear factorization:

$$3-2i;\ \ x^4-6x^3+11x^2+12x-26$$