1. Be able to sketch the graph of a function and describe how the graph is related to the graph of $y = x^2$.

a. $f(x) = (x+1)^2$	b. $f(x) = -(x-3)^2 + 1$

2. Be able to describe the graph of the quadratic function and identify the vertex and x-intercept (s).

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

Hmm... What *IS* the standard form of a quadratic equation?

3. Be able to write the equation of a parabola in standard form.

Vertex: (-2, 5); Point (0, 9)	Vertex: (1/2, 1); Point (-2, -21/5)

4. Be able to determine the x-intercepts of a function graphically and algebraically.
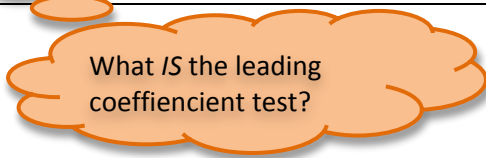
$f(x) = 2x^2 - 7x - 30$

5. Be able to factor a function in order to find the zeros and their multiplicity.

$f(t) = t^3 - 4t^2 + 4t$	$h(t) = t^2 - 6t + 9$

6. Be able to sketch the graph of a function by (a) applying the Leading Coefficient Test and (b) finding the zeros of a function.

$f(x) = x^3 - 9x$	$f(x) = -x^4 + 9x^2 - 20$

What *IS* the leading coeffiencient test?

The Factor Theorem states the following are equivalent:

$(x - a)$ is a factor of the polynomial → $f(a) = 0$ → a is a zero of f

7. Be able to use division (synthetic/box method) to show that x is a solution of a polynomial equation, and use the result to factor the polynomial completely. Additionally, be able to list all real solutions of the equation.

$x^3 - 28x - 48 = 0$ and $x = -4$	$48x^3 - 80x^2 + 41x - 6$ and $x = \dfrac{1}{2}$

8. Be familiar with operations with complex numbers. Perform the following operations and write the results in standard form.

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

b. $(2-i)(4+3i)$

c. $(3+2i)(3-2i)$

d. $4i(-1+5i)$

e. $(3+2i)^2$

f. $\dfrac{2+3i}{4-2i}$

What is Standard Form for Complex numbers?
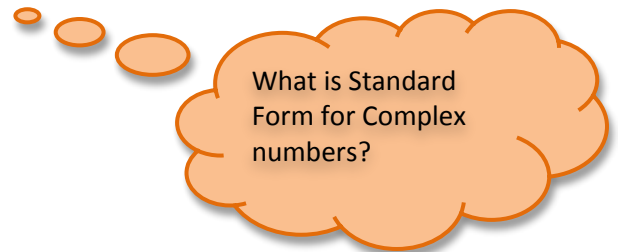
9. Be able to find ALL zeros of a polynomial function and write the polynomial as a product of linear factors.

$f(x) = 3x^3 - 5x^2 + 48x - 80$	$h(x) = x^2 - 4x + 1$

10. Be able to sketch the graph of a polynomial function. (These are the same problems as before, you just need to graph them)

$f(x) = 3x^3 - 5x^2 + 48x - 80$	$h(x) = x^2 - 4x + 1$

11. Be able to sketch the graph of a rational function. You should determine the zeros, holes, asymptotes, and the domain.

$f(x) = \dfrac{3x}{x^2 - x - 2}$	$h(x) = \dfrac{x^2 - 16}{x - 4}$