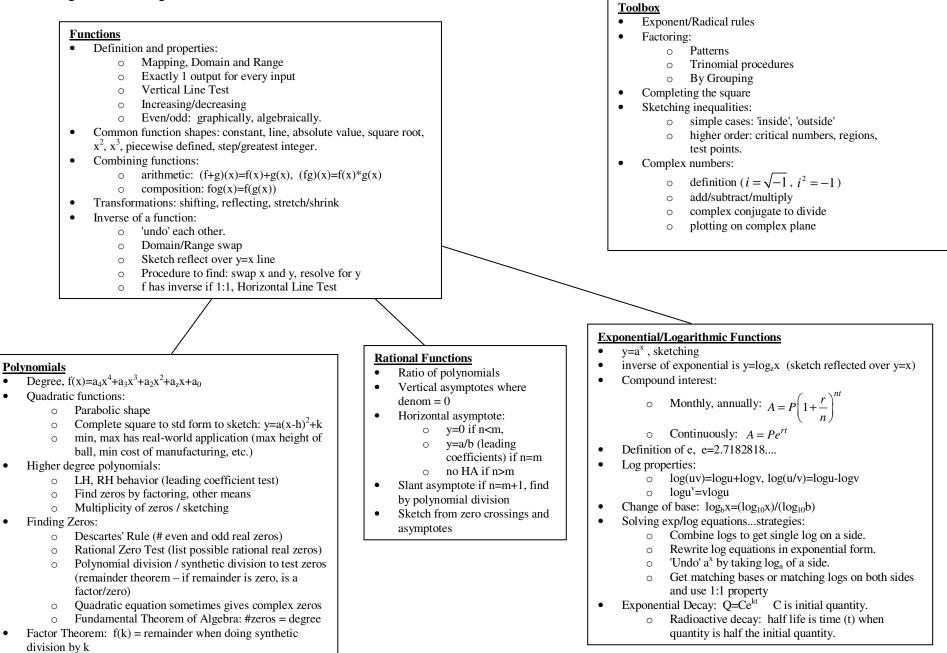
Honors Algebra 3-4 'Big Picture'

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Conic Sections

- Parabolas:
 - \circ (x-h)²=4p(y-k) or
 - \circ (y-k)²=4p(x-h
 - \circ (x-h)² like y=x², (y-k)² 'other one'
 - \circ (h,k)=vertex
 - p=dist. vertex to focus and vertex to directrix
 - Complete the square to get standard form equation

• Ellipses:

$$\circ \quad \frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

$$\circ \quad \frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$$

- \circ equation has + sign
- a is always bigger and a is under term of major axis
- (h,k)=center
- \circ $c^2 = a^2 b^2$
- \circ a=dist. center to vertex
- b=dist. center to point on minor axis
- c=dist. center to focus
- eccentricity e=c/a
- Complete the square to get standard form equation

• Hyperbolas:

$$\circ \quad \frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

$$\circ \quad \frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$$

- equation has sign
- a is not always bigger, a always under first term, first term is transverse axis
- \circ (h,k)=center
- \circ $c^2=a^2+b^2$
- \circ a=dist. center to vertex
- b=dist. to 'other side of box'
- c=dist. center to focus
- eccentricity e=c/a
- asymptotes through corners of box:

$$(y-k) = \pm \frac{b}{a}(x-h)$$
 or $(y-k) = \pm \frac{a}{b}(x-h)$

(look at box to see which)

- Complete the square to get standard form equation
- Given foci, vertices, start with sketch, then fill in std form equation.
- Which conic from general equation: $Ax^2+Cy^2+Dx+Ey+F=0$:
 - \circ 2 squared terms, same coefficient = circle
 - \circ 2 squared terms, same sign, different = ellipse
 - 2 squared terms, opposite signs = hyperbola
 - \circ 1 squared term = parabola