Chapter 2 Summary Sheet

Quadratics

Quadratic Function: $y = ax^2 + bx + c$ **Quadratic Formula:** $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

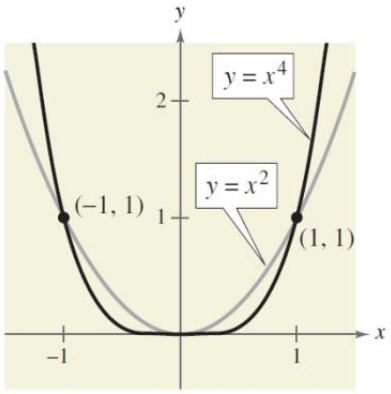
Standard Form: $y = a(x - h)^2 + k$ **Axis of Symmetry:** $x = -\dfrac{b}{2a}$

Vertex: (h, k) or $\left(-\dfrac{b}{2a}, f\left(-\dfrac{b}{2a}\right)\right)$

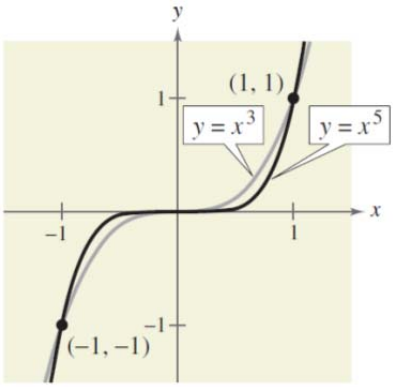
Graphing Polynomial Functions

Step 1: Find the zeros.
Step 2: If multiplicity of a zero is ODD, then the graph passes through the zero.
If multiplicity of a zero is EVEN, then the graph touches the zero and bounces off.
Step 3: Make a T-chart and find extra points for a more precise graph

If n is even for $f(x) = x^n$, then the graph is a U-shaped



If n is odd for $f(x) = x^n$, then the graph is a S-shaped.



Complex Numbers

Standard Form: $a + bi$ $i = \sqrt{-1}$ $i^2 = -1$

Finding Rational Zeros Algorithm

Step 1: Determine possible zeros: $\dfrac{\text{Factors of Constant}}{\text{Factors of Leading Coefficient}}$

Step 2: 3 Choices for Testing
1) Evaluate Algebraically
2) Synthetic Division
3) Use TI Table or Trace tool

Graphing Rational Functions

Step 1: Find the asymptotes and graph them with a dashed line
Vertical Asymptote(s): Find the zero(s) of the denominator
Horizontal Asymptote(s): 1) If the degree of the numerator is less than the degree of the denominator, then the horizontal asymptote is y = 0.
2) If the degree of the numerator and denominator are the same, then the horizontal asymptote is the ratio of the leading coefficients.
Slant Asymptote: If the degree of the numerator is greater than the degree of the denominator, then there is a slant asymptote which is the quotient.

Step 2: Create a T-Chart and find points on opposite sides of the vertical asymptote(s).

Nonlinear Inqualities

Step 1: Find the critical numbers. In other words, simply find the zeros.
Step 2: Test values between zeros for being positive or negative
Step 3: Determine which intervals satisfy the original inequality.