Math1050 Midterm 2

Formulas

Vertex of a Parabola:

For the parabola represented by $f(x)=ax^2+bx+c$,

the vertex is at $\left(\frac{-b}{2a}, f(\frac{-b}{2a})\right)$.

Definition of Log:

$\log_a y=x \iff a^x=y \qquad a>0$

Log Properties:

(1) $\log_a(bc)=\log_a b+\log_a c$

(2) $\log_a(\frac{b}{c})=\log_a b-\log_a c$

(3) $\log_a(b^n)=n\log_a b$

Change of Base formula:

$\log_a x=\frac{\log x}{\log a}=\frac{\ln x}{\ln a}$

Compound Interest formulas:

(1) Compounded n times per year: $A=P(1+\frac{r}{n})^{nt}$

(2) Compounded continuously: $A=Pe^{rt}$

Topics: (from sections 1.9, 2.1-2.7 and 3.1-3.3)

- Finding inverse function.
- Parabolas
  - vertex
  - sketch graph
  - x-intercepts
  - shifts/reflections/stretch or shrink
- Polynomial Division
  - Long Division
  - Synthetic Division
- Complex Numbers
- Finding zeros of a Polynomial
  - Descartes Rule of Signs
  - Rational Root Test
  - Complex roots come in conjugate pairs
  - relationship between factors and roots/zeros
  - multiplicity of zeros
- Analyzing Graph of Polynomial
  - Leading coefficient
  - General shapes
  - x-intercepts
- Analyzing Rational Function graphs
  - Vertical Asymptotes
  - Horizontal Asymptotes
  - Domain
  - x-intercepts
  - Graphs
- Solving Polynomial or Rational Inequalities
- Exponential and Logarithmic Graphs
  - General shape
  - shifts/reflections/stretch or shrink
  - Vertical Asymptotes
  - Horizontal Asymptotes
  - Domain
- Simplifying exponential/logarithmic expressions
- Solving simple logarithmic/exponential equations (use one-to-one property)