

Math1050 Final Exam

Formulas

Vertex of a Parabola:

For the parabola represented by $f(x) = ax^2 + bx + c$,
the vertex is at $\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$.

Definition of Log:

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

Log Properties:

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

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

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

Change of Base formula:

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

Compound Interest formulas:

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

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

Sum of arithmetic sequence:

$$\text{if } a_n = d(n-1) + a_1, \text{ then } \sum_{i=1}^n a_i = \frac{n(a_1 + a_n)}{2}$$

Sum of geometric sequence:

$$\text{if } a_n = a_1(r^{n-1}), \text{ then } \sum_{i=1}^n a_i(r^{n-1}) = \sum_{i=0}^n a_1(r^n) = \frac{a_1(1-r^n)}{1-r}$$

$$\text{and } \sum_{i=1}^{\infty} a_1(r^{n-1}) = \frac{a_1}{1-r} \text{ if } |r| < 1$$

n choose r:

$${}_n C_r = \binom{n}{r} = \frac{n!}{r!(n-r)!}$$