

FORMULA SHEET, EXAM 1

LINES

Equation of a line through the point (x_1, y_1) with slope m :

$$y - y_1 = m(x - x_1)$$

FORMULAS FOR A QUADRATIC FUNCTION, $f(x) = ax^2 + bx + c$:

Quadratic Equation:

$$f(x) = 0 \text{ if and only if } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Coordinates of the vertex of a parabola:

$$x = \frac{-b}{2a}, \quad y = c - \frac{b^2}{4a}$$

MATHEMATICAL MODELS

Compounding Interest m times a year.

$$\text{Future Value, } F = P(1 + i)^n = P \left(1 + \frac{r}{m}\right)^{mt},$$

$$\text{Present Value, } P = \frac{F}{\left(1 + \frac{r}{m}\right)^{mt}},$$

Continuously compounding interest:

$$\text{Future Value, } F = Pe^{rt},$$

$$\text{Present Value, } P = Fe^{-rt},$$

LOGARITHMS

Properties of Logs:

$$a^{\log_a(x)} = x$$

$$\log_a(a^x) = x$$

$$\log_a(xy) = \log_a(x) + \log_a(y)$$

$$\log_a(x/y) = \log_a(x) - \log_a(y)$$

$$\log_a(x^c) = c \log_a(x)$$