Formulas for Math 1320 Exam 1

Equation of a linear function: $y = mx + b$ or $f(x) = mx + b$, where $m = \frac{y_2 - y_1}{x_2 - x_1}$.

Cost function: $C(x) = mx + b$, where m is the marginal cost and b is the fixed cost, and $m = \frac{C_2 - C_1}{x_2 - x_1}$.

Revenue: $R(x) = mx$, where m is the marginal revenue. Also, $R = (\text{price}) \times (\text{quantity})$.

Profit: $P(x) = R(x) - C(x)$.

Supply and demand: Both have the form $q = mp + b$. For demand, $m < 0$; for supply $m > 0$. In both cases, $m = \frac{q_2 - q_1}{p_2 - p_1}$.

Parabolas: Functions have the form $f(x) = ax^2 + bx + c$.

- Vertex at the point $\left(-\frac{b}{2a}, f\left(\frac{-b}{2a}\right)\right)$.
- y-intercept at $(0, c)$
- To find x-intercepts, solve $ax^2 + bx + c = 0$ for x.

Exponential Growth and Decay: Formulas are $Q(t) = Q_0 e^{kt}$ (growth) and $Q(t) = Q_0 e^{-kt}$ (decay), where Q_0 is the quantity at time $t = 0$. For growth, $k = \frac{\ln(2)}{\text{doubling time}}$ and for decay, $k = \frac{\ln(2)}{\text{half-life}}$.

Alternate form for exponential functions is $y = Ab^x$.