Midterm 3 formulas

Random Variables via Table $\mu_X = p_1 x_1 + p_2 x_2 + \cdots$

$\sigma_X = \sqrt{p_1(x_1 - \mu_X)^2 + p_2(x_2 - \mu_X)^2 + \cdots}$

Random Variable via Linear Transform If $Y = a + bX$ then $\mu_Y = a + b\mu_X$ and $\sigma_Y = b\sigma_X$

Random Variable Sum If $Z = X + Y$, then $\mu_Z = \mu_X + \mu_Y$. If X, Y are independent, then $\sigma_Z^2 = \sigma_X^2 + \sigma_Y^2$.

Binomial Distribution $\mu_X = np$, $\sigma_X = \sqrt{np(1-p)}$

$\mu_{\hat{p}} = p$, $\sigma_{\hat{p}} = \frac{\sqrt{p(1-p)}}{\sqrt{n}}$

IID Setting $\mu_{\bar{x}} = \mu$

$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$