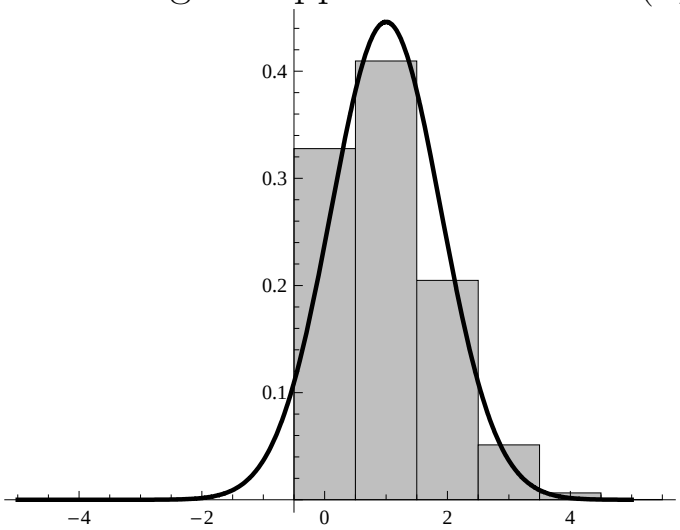
Normal approximation for binomial distributions

- if X has the binomial distribution $B(n, p)$, then

$$\mu_X = np \qquad \text{and} \qquad \sigma_X = \sqrt{np(1-p)}$$

- compare $B(n, p)$ with the normal distribution that has this mean and standard deviation: $N(np, \sqrt{np(1-p)})$

Example:
For $B(5, 0.2)$, have $\mu_X = 1$ and $\sigma_X = \sqrt{0.8} = 0.894$.
$N(1, 0.984)$ is not a good approximation of $B(5, 2)$.



Example:
For $B(100, 0.3)$, have $\mu_X = 30$ and $\sigma_X = \sqrt{6.3} = 2.51$.
$N(30, 2.51)$ is a good approximation of $B(100, 0.3)$.