

Probability Distributions

Binomial Distribution

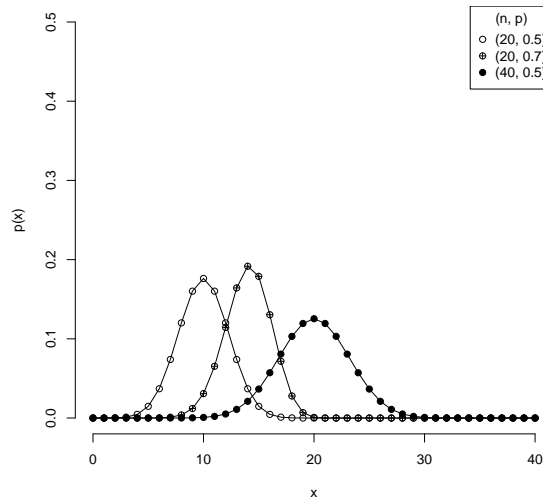


Figure 1: Binomial Distribution

$$X \sim \text{Binomial}(n, p)$$

$$x = 0, 1, 2, \dots, n$$

$$0 < p < 1$$

$$p(x) = \binom{n}{x} p^x (1-p)^{n-x}$$

$$\mu = E[X] = np$$

$$\sigma^2 = E[(x - \mu)^2] = np(1-p)$$

Normal Distribution

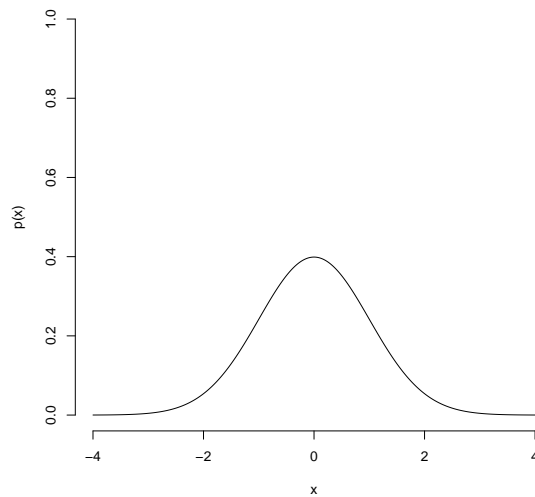


Figure 2: Normal(0, 1) Distribution

$$X \sim \text{Normal}(\mu, \sigma^2)$$

$$-\infty < x < \infty$$

$$-\infty < \mu < \infty$$

$$0 < \sigma^2 < \infty$$

$$p(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp \left[-\frac{(x - \mu)^2}{2\sigma^2} \right]$$

$$\mu = E[X] = \mu$$

$$\sigma^2 = E[(x - \mu)^2] = \sigma^2$$