

You try it

Random variables Y_1, Y_2, \dots, Y_n are independent with mean 3.2 and variance 6. Find:

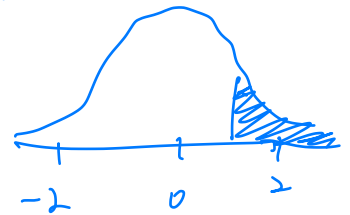
- The approximate distribution of \bar{Y} , the mean of the observations assuming n is reasonably large.
- $P(Y > 3.7)$ if $n = 40$.
- The approximate distribution of $6(\bar{Y} - 3.2)^2$ if $n = 36$.

$$(a) \bar{Y} \sim N(3.2, \frac{6}{n})$$

$$(b) P(\bar{Y} > 3.7) = P\left(\frac{\bar{Y} - 3.2}{\sqrt{6/40}} > \frac{3.7 - 3.2}{\sqrt{6/40}}\right)$$
$$= P(Z > 1.291)$$

$$1 - \text{pnorm}(1.291)$$

$$0.09835$$



$$(c) \bar{Y} \sim N(3.2, \frac{6}{36})$$

$$\frac{\bar{Y} - 3.2}{\sqrt{1/6}} \sim N(0, 1)$$

$$\sqrt{6}(\bar{Y} - 3.2) \sim N(0, 1)$$

$$6(\bar{Y} - 3.2)^2 \sim \chi^2_1$$