1. Write the formula for standard deviation of a sample proportion.

2. If you want to cut the standard deviation in half, what must you do to the sample size? Explain.

3. Write the name for each of the following symbols:

(a) $\hat{p}$ (b) $\bar{x}$ (c) p (d) μ

(e) $\mu_{\hat{p}}$ (f) $\sigma_{\hat{p}}$ (g) $\mu_{\bar{x}}$ (h) $\sigma_{\bar{x}}$

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

In order to reduce the standard deviation by 1/2, QUADRUPLE the sample size.

$$a = \sqrt{\frac{b}{n}}$$

$$a = \frac{\sqrt{b}}{\sqrt{4n}} \rightarrow \frac{\sqrt{b}}{\sqrt{4n}} = \frac{\sqrt{b}}{2\sqrt{n}}$$

half

$$2a = \frac{\sqrt{b}}{\sqrt{n}}$$

(a) $\hat{p}$ sample proportion

(b) $\bar{x}$ sample mean

(c) $p \rightarrow$ population prop.

(d) $\mu \rightarrow$ pop. mean

(e) $\mu_{\hat{p}} \rightarrow$ mean of sampling distribution of $\hat{p}$

(f) $\sigma_{\hat{p}}$ → std dev of sampling distribution of $\hat{p}$

(g) $\mu_{\bar{x}}$ → mean of sampling distr. of sample means ($\bar{x}$)

(h) $\sigma_{\bar{x}}$ → std dev of sampling distr. of $\bar{x}$

sample mean $\rightarrow \mu$

sample seje $\geq 10\%$ pop.

std dev $\rightarrow \dfrac{\sigma}{\sqrt{n}}$

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

p.448

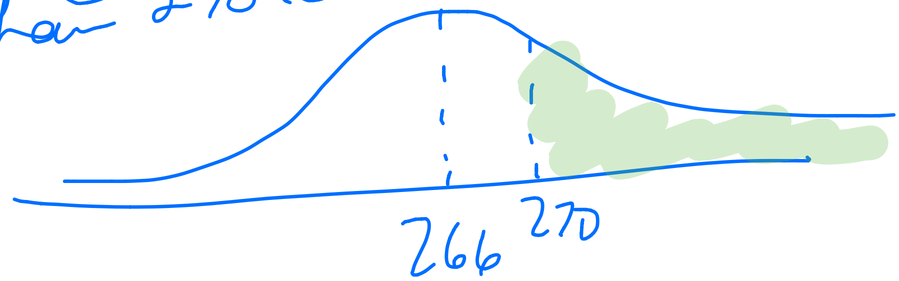
$\mu = 266$ $\sigma = 16$

1. $P(x > 270)$

$$z = \frac{270 - 266}{16}$$

$Z = 0.25$

Looking at the table, I see the area less than 270 is 0.5987.



Therefore the probability that a randomly selected pregnant woman would have a pregnancy longer than 270 days is $1 - 0.5987$ or 0.4013.

$\bar{X} = 266$ because the sample mean is the same as the population mean.

$$\sigma_{\bar{X}} = \frac{16}{\sqrt{6}} = 6.532 \text{ days}$$

10% PP → Are there more tha

60 pregnant women? ✓

④ Normal distr. ✓

$\mu_{\bar{x}} = 266$ $\sigma_{\bar{x}} = 6.532$

$P(\bar{X} > 270)$

$$z = \frac{270 - 266}{6.532} = 0.612$$

From the table, approx. 0.7291 is less than 270, so 0.2709 is the probability that the mean pregnancy length for the women in the sample exceeds 270 days.