1) If out of 100 students surveyed at a school 46 of them said they like to watch the T.V show "Big Brother" what would be the value of p-hat, and is p-hat a statistic or a parameter?

2) Using the information from problem #3 what would be the approximate value of p and what would be the standard deviation of our sample proportion?

Sample Proportions

$\hat{p} = \frac{46}{100} = .46$

$\mu_{\hat{p}} = p$

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

$= \sqrt{\frac{(.46)(.54)}{100}} \approx .0498$

1) An SRS of 1000 first-year college students were asked whether they applied for admission to any other college. In fact, 47% of all first-year students applied to colleges beside the one they are attending.

What is the probability that the poll will be within 2 percentage points of the true p? (Between 45% and 49%)

47%.

Conditions

1. Random Samp ✓
2. 10n < Pop Size ✓
3. $np \geq 10$ ✓ ✓ $n(1-p) \geq 10$ ✓

(*) $n = 1000$

$p = .47$

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

$$Z = \frac{.49 - .47}{\sqrt{\frac{(.47)(.53)}{1000}}} = \frac{.02}{.0158} \approx 1.27 \quad (.8980)$$

$$Z = \frac{.45 - .47}{\sqrt{\frac{(.47)(.53)}{1000}}} = \frac{-.02}{.0158} \approx -1.27 \quad (.1020)$$

$.8980 - .1020$

$= .7960$

1) A population of manufactured products where the random variable X is the weight of the item. Prior experience has shown that the weight has a distribution with mean 5.0 ounces and standard deviation of 2.0 ounces.

NORMAL

$\mu = 5$

$\sigma = 2$

$Z = \frac{6.5 - 5}{2}$

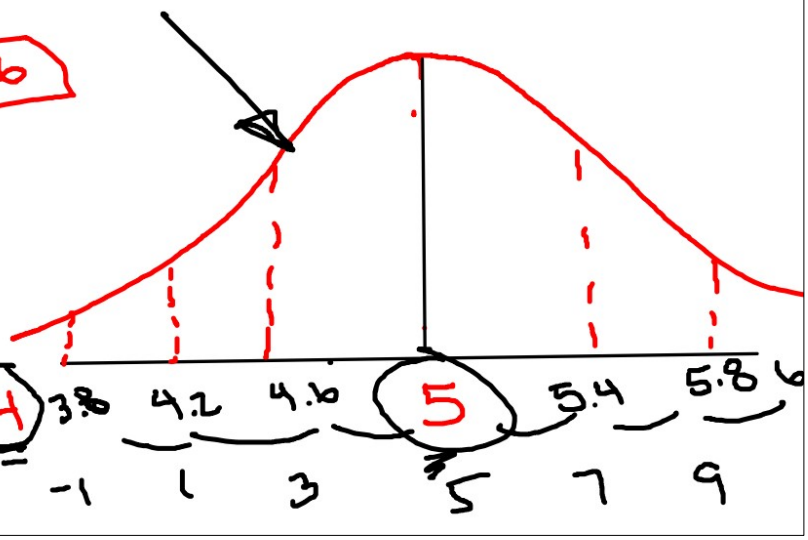
$Z = \frac{1.5}{2} = .75$ (.7734)

a. What is the probability that the weight of an item randomly selected will be more than 6.5 ounces?

$1 - .7734 = .2266$

b. Using proper notation, show the distribution of $\bar{x}$ when $n = 25$

$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{2}{\sqrt{25}} = .4$



a. What is the probability that the average score for the 64 people will be more than 49.4? ✓

$\mu = 48.6$

$\sigma = 4$

$$z = \frac{\bar{x} - \mu}{\sigma_{\bar{x}}}$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{4}{\sqrt{64}} = \frac{4}{8}$$

$$z = \frac{49.4 - 48.6}{.5} = \frac{.8}{.5}$$

$z = 1.60$ (.9452)

$1 - .9452$

$\rightarrow .0548$