1. According to Gallup, about 33% of Americans polled said they frequently experience stress in their daily lives. Suppose you are in a class of 45 students.
   a. What is the probability that no more than 12 students in the class will say that they frequently experience stress in their daily lives? (Make sure to identify the sampling distribution you use and check all necessary conditions.)

   b. If 20 students in the class said they frequently experience stress in their daily lives, would you be surprised? Explain, and use statistics to support your answer.

2. The average composite ACT score for Ohio students who took the test in 2003 was 21.4. Assume that the standard deviation is 1.05. In a random sample of 25 students who took the exam in 2003, what is the probability that the average composite ACT score is 22 or more? (Make sure to identify the sampling distribution you use and check all necessary conditions.)

1. It is generally believed that electrical problems affect about 14% of new cars. An automobile mechanic conducts diagnostic tests on 128 new cars on the lot.
   a. Describe the sampling distribution for the sample proportion by naming the model and telling its mean and standard deviation. Justify your answer.

   b. Sketch and clearly label the model.

   c. What is the probability that in this group over 18% of the new cars will be found to have electrical problems?

2. Herpetologists (snake specialist) found that a certain species of reticulated python have an average length of 20.5 feet with a standard deviation of 2.3 feet. The scientists collect a random sample of 30 adult pythons and measure their lengths. In their sample the mean length was 19.5 feet long. One of the herpetologists fears that pollution might be affecting the natural growth of the pythons. Do you think this sample result is unusually small? Explain.

Solutions to Review Activity

1. a) Using the Central Limit Thm

To apply the CLT for proportions, I must first check conditions so that the $\hat{p}$'s have to be in a normal distribution.

i) the 95 students in the sample are not randomly selected but I'm led to believe their responses are independent from one another

ii) 95 is less than 10% of all people that could have been sampled

iii) $35(95) = 1995$ and $67(95) = 6365$ both are larger than 10

Since the conditions are basically met I can proceed with a normal distribution

$\mu_{\hat{p}} = .35$

Normalcdf $\left(.35, \frac{.35-.35}{\sqrt{\frac{.35(.65)}{95}}}\right)$

Normalcdf $(.35, 1E99) = .5$

i) $\frac{20}{45} = .444$

In a normal distribution, that piece of data has a z-score of...

$$\frac{.444 - .32}{.07545} = 1.676$$

No, I wouldn't be surprised, that z-score is not larger than 3.

(B) To answer this, I would want to apply the CLT for means, but to do so I'll need these conditions:

i) for the 35 students were randomly selected
ii) 35 is less than 10% of all students that took the ACT exam
iii) the sample size is not above 30 but it's close so I'll proceed anyway.

$\sigma_{\bar{x}} = \frac{1.65}{\sqrt{35}} = .2[illegible]$

$.279$