## Are you sure Mrs. Gallas isn't a good free throw shooter?







In our introduction to significance tests, we used simulation to estimate a P-value to decide whether or not Mrs. Gallas was exaggerating about her free throw percentage. Today, we will use a formula to find a *P*-value.

- 1. We're going to carry out the significance test from lesson 9.1 again. Begin by writing the hypotheses.
- 2. a. Each class found a different P-value because each dotplot was different. Would it be appropriate to use a Normal distribution to model the sampling distribution of  $\hat{p}$ ? Justify your answer.
  - b. Are there any other conditions we should check?
- 3. Now that conditions have been met, find the mean and standard deviation of the sampling distribution of  $\hat{p}$ .
- 4. Use the mean and standard deviation you found to label the Normal curve.
- 5. How many standard deviations below the mean (*z*-score) is  $\hat{p} = 0.64$ ? Label it on the normal curve.
- 6. Find the probability of an 80% shooter making 32/50 (  $\hat{p} = 0.64$ ) or less.



7. What conclusion can we make?



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## Significance Test for *p*

Important ideas:		

## **Check Your Understanding**

Sharon claims that 90% of students can identify the smell of a skunk. She carries out a study to test this theory. She selects a random sample of 100 students and asks them each to take a whiff from a bag that is filled with skunk smell. She finds that 84 are able to correctly identify the smell as that of a skunk. She would like to know if these data provide convincing evidence that less than 90% of students can identify the smell of a skunk. Use  $\alpha$  = 0.05.

- a. State appropriate hypotheses for performing a significance test. Be sure to define the parameter of interest.
- b. Explain why the sample result gives some evidence for the alternative hypothesis.
- c. Check if the conditions for performing the significance test are met.
- d. Calculate the standardized test statistic and *P*-value.

e. What conclusion should Sharon make?

