

# Tests About a Proportion Day 1

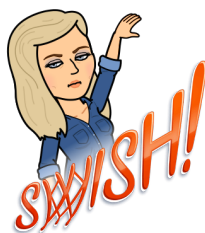
*Are you sure Mrs. Gallas isn't a good free throw shooter?*

## Learning Targets

- State and check the Random, 10%, and Large Counts conditions for performing a significance test about a population proportion.
- Calculate the standardized test statistic and  $P$ -value for a test about a population proportion.

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

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

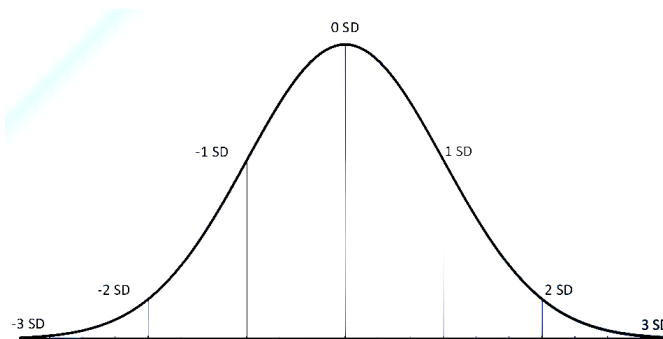


# VS



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?



Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

## 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  $\alpha = 0.01$ .

- State appropriate hypotheses for performing a significance test. Be sure to define the parameter of interest.
- Explain why the sample result gives some evidence for the alternative hypothesis.
- Check if the conditions for performing the significance test are met.
- Calculate the standardized test statistic and  $P$ -value.
- What conclusion should Sharon make?