SWBAT: Review sampling distributions of sample proportions and means 
TEST REVIEW

7. The central limit theorem refers to which of the following characteristic of the sampling distribution of the sample mean?

a) Regardless of the shape of the population's distribution, the sampling distribution of the sample mean from sufficiently large samples will be approximately Normally distributed.

b) Regardless of the shape of the population’s distribution, the standard deviation of the sampling distribution of the sample mean from sufficiently large samples will be \( \frac{\sigma}{\sqrt{n}} \).

c) As you take larger and larger samples from a Normally distributed population, the mean of the sampling distribution of the sample mean gets closer and closer to the population mean.

Scenario 7-8
The scores of individual students on the American College Testing (ACT) Program composite college entrance examination have an approximately Normal distribution with mean 18.6 and standard deviation 6.0. At Northside High, 36 seniors take the test. Assume that the scores at this school have the same distribution as national scores.

8. Use Scenario 7-8. What is the standard deviation of the sampling distribution of mean scores for the 36 students?

A. 0.41
B. 1.0
C. 3.1
D. 6.0
E. 18.6

9. The weights of Granny Smith apples from a large orchard are Normally distributed with a mean of 380 gm and a standard deviation of 28 gm.

(a) A single apple is selected at random from this orchard. What is the probability that it weighs more than 400 gm?

\[ z = \frac{400 - 380}{28} = 0.7143 \]

\[ p(z > 0.7143) = 0.2375 \]

(b) Three apples are selected at random from this orchard. What is the probability that their mean weight is greater than 400 gm?

\[ z = \frac{400 - 380}{\frac{28}{\sqrt{3}}} = 16.16 \]

\[ z = \frac{400 - 380}{16.16} = 1.2372 \]

\[ p(z > 1.2372) = 0.1080 \]

(c) Explain why the probabilities in (a) and (b) are not equal.

The distribution changed when taking a sample of size 3, we must compare 3 to all samples possible of size 3. Thus the new sampling distribution with \( \mu = 380 \) and \( \sigma = 16.16 \) is created.