

Hypothesis Testing

The article “**Theaters Losing Out to Living Rooms**” (*San Luis Obispo Tribune*, June 17, 2005) states that movie attendance declined in 2005. The Associated Press found that 542 of 1,000 randomly selected adult Americans prefer to watch movies at home rather than at a movie theater. Is there convincing evidence that a majority (more than 50%) of adult Americans prefer to watch movies at home? Test the relevant hypothesis using a 0.05 level of significance.

- 18) Find $\hat{p}$ for the proportion of the sample of Americans who prefer to watch movies at home rather than at a movie theater. (3 decimal places)

Complete the following areas.

- 19) H_0 : _____
20) H_1 : _____
21) Type of Test: _____
22) Test Statistic: _____ (2 decimal places)
23) Critical Value(s): _____ (2 decimal places)
24) P-Value: _____ (4 decimal places)
25) Label the critical value and test statistic on the curve and shade the rejection region(s).



- 26) Reject or Fail to Reject: _____
27) Conclusion (express in a sentence in the context of the problem)

Hypothesis Testing

Many consumers pay careful attention to stated nutritional content on packaged foods when making purchases, so it is important that the information on packages be accurate. A random sample of 12 frozen dinners of a certain type was selected and the calorie content of each one was determined. Below are the resulting observations. Assume the data is normally distributed. The stated mean calorie content is 240. Perform a hypothesis test to determine if the actual mean calorie content is different from the stated package value of 240. Use a 0.01 level of significance.

255	244	239	242	265	245
259	248	225	226	254	233

- 28) Using technology (calculator or *StatCrunch*), find the sample mean and sample standard deviation. (Round two decimal places).

Complete the following areas.

- 29) H_0 : _____
30) H_1 : _____
31) Type of Test: _____
32) Test Statistic: _____ (2 decimal places)
33) Critical Value(s): _____ (3 decimal places)

- 34) P-Value: _____ (4 decimal places)
- 35) Label the critical value and test statistic on the curve and shade the rejection region(s).



- 36) Reject or Fail to Reject: _____
- 37) Conclusion (express in a sentence in the context of the problem)

Normal Distributions/Central Limit Theorem

The total energy needed during pregnancy is normally distributed, with mean of 2600 kcal/day and a standard deviation of 50 kcal/day (Source: American Dietetic Association). **Complete all steps of this problem by hand, you must show the work to receive credit.**

- 38) Is the total energy need during pregnancy qualitative or quantitative?
- 39) What is the probability that a randomly selected pregnant woman has an energy need of more than 2625 kcal/day? Is this unusual? (round four decimal places)
- 40) Describe the sampling distribution of the sample mean daily energy requirement for a random sample of 20 pregnant women.
- 41) What is the probability that a random sample of 20 pregnant women has a mean energy need of more than 2625 kcal/day? Is this unusual? (round four decimal places)
- 42) What is the probability that a random sample of 20 pregnant women has a mean energy need between 2580 and 2615? (round four decimal places)