Chapter 9: Introduction to Hypothesis Testing

Multiple Choice

This activity contains 13 questions.

1. [Hint]

If H_o is $\mu \geq 20$, which of the following represents a Type I error?

- *$\mu = 12$; reject H_o*
- *$\mu = 22$; reject H_o*
- *$\mu = 12$; do not reject H_o*
- *$\mu = 22$; do not reject H_o*

2. [Hint]

Which of the following is true about hypotheses?

- *In a research situation, the null hypothesis makes the claim that the new is better than the old.*
- *The null hypothesis represents the condition that will be assumed to exist unless sufficient evidence is presented to show the condition has changed.*
- *The null hypothesis is the statement the researcher wishes to show to be true.*
- *The null and alternative hypotheses must be stated in terms of the sample value of interest.*

3. [Hint]

If H_o is $\mu \geq 10$, which of the following represents a Type II error?

- *$\mu = 9$; reject H_o*
- *$\mu = 10$; reject H_o*
- *$\mu = 9$; do not reject H_o*
- *$\mu = 10$; do not reject H_o*

4. [Hint]

The probability (assuming the null hypothesis is true) of obtaining a test statistic at least as extreme as the test statistic that was calculated from the sample is known as the

- *p-value.*
- *significance level.*
- *power.*
- *confidence level.*

5. [Hint] ***Find the critical z-value for the hypothesis test calculated at α = 5% when H_0 : μ ≥ 20 and H_A : μ < 20; σ = 0.8; $\bar{x}$ = 19.8; and n = 50.***

- *-1.47*
- *-1.645*
- *-1.767*
- *-1.96*

6. [Hint] ***Find the z-value for the test statistic for the hypothesis test calculated at α = 5% when H_0 : μ ≥ 20; σ = 0.8; $\bar{x}$ = 19.8; and n = 50.***

- *-1.65*
- *-1.768*
- *-1.877*
- *-1.96*

7. [Hint] ***The manufacturer of headache pills assumes that each contains 200 mg of active ingredient and being under or being over is undesirable. If they are going to test at the 10% significance level, what should be their decision rule for rejecting the null hypothesis?***

- *If* $z < -1.645$, *reject the null hypothesis.*
- *If* $z \geq 1.645$, *reject the null hypothesis.*
- *If* $z < -1.645$ *or* $z > 1.645$, *reject the null hypothesis.*
- *If* $-1.645 \leq z \leq 1.645$, *reject the null hypothesis.*

8. [Hint] ***The maximum allowable probability of committing a Type I statistical error is known as the***

- *significance level.*
- *critical value.*
- *power.*
- *p-value.*

9. [Hint] ***In order to test the claim that the proportion of republican voters in a particular city is less than 60 percent, a random sample of 150 voters was selected and found to consist of 54 percent Republicans. What is the p-value for this sample?***

- *0.0025*
- *0.0169*
- *0.0325*
- *0.0668*

10. [Hint] ***Which of the following is <u>not</u> one of the conditions for using the t-distribution.***

- *σ is unknown.*
- *The sample size is small.*
- *The hypothesis test is one-tailed.*
- *The population is normally distributed.*

11. [Hint] ***Which of the following can be used to decrease both α and β?***

- *Increase the sample size.*
- *Decrease the desired confidence.*
- *Develop new hypotheses.*
- *Reduce the standard deviation.*

12. [Hint] ***The probability that a hypothesis test will reject the null hypothesis when the null hypothesis is false is called***

- *confidence.*
- *error.*
- *power.*
- *significance.*

13. [Hint] ***What is the z-value for the test statistic for the following hypothesis test?*** $H_0 : \pi \geq 0.09$ and $H_A : \pi < 0.09$ ***; n = 60; the sample proportion is 0.085 and α = 0.10.***

- *-0.1309*
- *-0.1326*
- *-0.1353*
- *-0.1377*