



MyStatLab Answers

- 1) Twelve different video games showing violence were observed. The duration times of violence were recorded, with the times (seconds) listed below. What requirements must be satisfied to test the claim that the sample is from a population with a mean greater than 85 sec? Are the requirements all satisfied?

| | | | | | | | | | | | |
|----|----|-----|----|---|----|-----|----|-----|---|---|----|
| 80 | 14 | 593 | 54 | 0 | 61 | 203 | 46 | 172 | 0 | 2 | 54 |
|----|----|-----|----|---|----|-----|----|-----|---|---|----|

What requirements must be satisfied? Select all that apply.

- A. The sample observations must be a simple random sample.
- B. Either the population is normally distributed, or $n > 30$, or both.
- C. At least one observation must be above or below 85 sec.
- D. The conditions for a binomial distribution must be satisfied.

Ans:

- A. The sample observations must be a simple random sample.
- B. Either the population is normally distributed, or $n > 30$, or both.

Are the requirements all satisfied?

- A. No. The conditions for a binomial distribution are not satisfied, and there is not enough information given to determine whether the sample is a simple random sample.
- B. No. The sample size is not greater than 30, the sample does not appear to be from a normally distributed population, and there is not enough information given to determine whether the sample is a simple random sample.
- C. No. The sample size is not greater than 30, the sample does not appear to be from a normally distributed population, and there are no observations above 85 sec.
- D. Yes. A normal quantile plot suggests that the sample is from a normally distributed population, and there are observations above and below 85 sec.
- E. Yes. A normal quantile plot suggests that the sample is from a normally distributed population, and there is enough information to determine that the sample is a simple random sample.
- F. Yes. The conditions for a binomial distribution are satisfied, and there is enough information to determine that the sample is a simple random sample.

Ans:

- B. No. The sample size is not greater than 30, the sample does not appear to be from a normally distributed population, and there is not enough information given to determine whether the sample is a simple random sample.

- 2) The display provided from technology available below results from using data for a smartphone carrier's data speeds at airports to test the claim that they are from a population having a mean less than 6.00 Mbps. Conduct the hypothesis test using these results. Use a 0.05 significance level. Identify the null and alternative hypotheses, test statistic, P-value, and state the final conclusion that addresses the original claim.

Technology output:

| T-Test | |
|-------------|-----------|
| $\mu <$ | 6.00 |
| t = | -0.364485 |
| p = | 0.358532 |
| \bar{x} = | 5.72 |
| Sx = | 5.432044 |
| n = | 50 |

Identify the test statistic.

Ans: -0.36 (Round to two decimal places as needed.)

Identify the P-value.

Ans: 0.359 (Round to three decimal places as needed.)

State the final conclusion that addresses the original claim.

Ans:

Failed to reject H_0 . There is **not sufficient** evidence to support the claim that the sample is from a population with a mean less than 6.00 Mbps.

- 3) A data set includes data from 500 random tornadoes. The display from technology available below results from using the tornado lengths (miles) to test the claim that the mean tornado length is greater than 2.8 miles. Use a 0.05 significance level. Identify the null and alternative hypotheses, test statistic, P-value, and state the final conclusion that addresses the original claim.

Technology output:

Display from Technology

| Hypothesis test results: | | | | | |
|--------------------------|--------------------|-----------|-----|----------|---------|
| μ | = Mean of variable | | | | |
| H_0 | : $\mu = 2.8$ | | | | |
| H_a | : $\mu > 2.8$ | | | | |
| Variable | Sample Mean | Std. Err. | DF | T-Stat | P-value |
| Length | 3.30635 | 0.240288 | 499 | 2.115604 | 0.0174 |

What are the null and alternative hypotheses?

H_0 : $\mu = 2.8$ miles

H_1 : $\mu > 2.8$ miles

Identify the test statistic.

Ans: 2.12 (Round to two decimal places as needed.)

Identify the P-value.

Ans: 0.017 (Round to three decimal places as needed.)

State the final conclusion that addresses the original claim.

Ans: **Reject H_0 .** There is **sufficient** evidence to support the claim that the mean tornado length is greater than 2.8 miles.

4) **For a hypothesis test of the claim that the mean amount of sleep for adults is less than 8 hours, technology output shows that the hypothesis test has power of 0.4516 supporting the claim that $\mu < 8$ hours of sleep when the actual population mean is 6.5 hours of sleep. Interpret this value of the power, then identify the value of β and interpret that value.**

Interpret this value of the power.

Ans:

The chance of recognizing that $\mu < 8$ hours is not very high when in reality $\mu = 6.5$ hours.

Identify the value of β and interpret that value. Select the correct choice below and fill in the answer box to complete your choice.

Ans: The value $\beta = 1 - 0.4516 = 0.5484$ indicates that there is a greater than 50% chance of failing to recognize that $\mu < 8$ hours when in reality $\mu = 6.5$ hours.

5) **Determine whether the results appear to have statistical significance, and also determine whether the results appear to have practical significance. In a study of a birth sex selection method used to increase the likelihood of a baby being born female, 1928 users of the method gave birth to 944 males and 984 females. There is about 19% chance of getting that many babies born female if the method had no effect.**

Answer:

Because there is a 19% chance of getting that many babies born female if the method had no effect, the method **does not have statistical significance** not many couples would likely use a procedure that raises the likelihood of a baby born female from the approximately 50% rate expected by chance to the **51%** produced by this method.

So this method **does not have practical significance**

6) **Construct one table that includes relative frequencies based on the frequency distributions shown below, then compare the amounts of tar in nonfiltered and filtered cigarettes. Do the cigarette filters appear to be effective? (Hint: The filters reduce the amount of tar ingested by the smoker.)**

These are some of the few and the most helpful list of
[MyStatLab Answers.](#)

| Tar (mg) in Nonfiltered Cigarettes | | Tar (mg) in Filtered Cigarettes | |
|------------------------------------|-----------|---------------------------------|-----------|
| Tar (mg) | Frequency | Tar (mg) | Frequency |
| 19 - 24 | 1 | 7 - 12 | 1 |
| 25 - 30 | 0 | 13 - 18 | 2 |
| 31 - 36 | 14 | 19 - 24 | 6 |
| 37 - 42 | 8 | 25 - 30 | 16 |
| 43 - 48 | 2 | | |

Total number for (non-filtered)=1+0+14+8+2=25

Total number for (Filtered)=1+2+6+16=25

Complete the relative frequency table below.

| Tar (mg) | Relative Frequency (Non-filtered) | Relative Frequency (Filtered) |
|----------|-----------------------------------|-------------------------------|
| 7-12 | 0% $(=0/25)*100\%$ | 4% $(=1/25)*100\%$ |
| 13-18 | 0% | 8% |
| 19-24 | 4% | 24% |
| 25-30 | 0% | 64% |
| 31-36 | 56% | 0% |
| 37-42 | 32% | 0% |
| 43-48 | 8% | 0% |

Do cigarette filters appear to be effective?

Ans: Yes, because the relative frequency of the higher tar classes is greater for nonfiltered cigarettes.

7) Construct a stem-and-leaf plot of the test scores:

67,73,86,75,89,89,88,90,98,100

Ascending order: 67,73,75,86,88,89,89,90,98,100

Construct the stem-and-leaf plot. Choose the correct answer below.

| Stem | Leaves |
|------|---------|
| 6 | 7 |
| 7 | 3 5 |
| 8 | 6 8 9 9 |
| 9 | 0 8 |
| 10 | 0 |

How does the stem-and-leaf plot show the distribution of these data?

Ans:

The lengths of the rows are similar to the heights of bars in a histogram; longer rows of data correspond to higher frequencies.

8) A sample of blood pressure measurements is taken from a data set and those values (mm Hg) are listed below. The values are matched so that subjects each have systolic and diastolic measurements. Find the mean and median for each of the two samples and

then compare the two sets of results. Are the measures of center the best statistics to use with these data? What else might be better?

| Systolic | Diastolic |
|----------|-----------|
| 122 | 74 |
| 145 | 89 |
| 96 | 79 |
| 117 | 62 |
| 124 | 65 |
| 128 | 72 |
| 146 | 66 |
| 131 | 69 |
| 120 | 78 |
| 110 | 87 |

Find the means.

The mean for systolic is 123.9 mm Hg and the mean for diastolic is 74.1 mm Hg.

Find the medians.

The median for systolic is 123 mm Hg and the median for diastolic is 73 mm Hg.

Compare the results. Choose the correct answer below.

- A. The mean and the median for the diastolic pressure are both lower than the mean and the median for the systolic pressure.
- B. The median is lower for the diastolic pressure, but the mean is lower for the systolic pressure.
- C. The mean is lower for the diastolic pressure, but the median is lower for the systolic pressure.
- D. The mean and the median for the systolic pressure are both lower than the mean and the median for the diastolic pressure.
- E. The mean and median appear to be roughly the same for both types of blood pressure.

Ans: (A) The mean and the median for the diastolic pressure are both lower than the mean and the median for the systolic pressure.

Are the measures of center the best statistics to use with these data?

- A. Since the systolic and diastolic blood pressures measure different characteristics, a comparison of the measures of center doesn't make sense.
- B. Since the sample sizes are large, measures of center would not be a valid way to compare the data sets.
- C. Since the systolic and diastolic blood pressures measure different characteristics, only measures of center should be used to compare the data sets.
- D. Since the sample sizes are equal, measures of center are a valid way to compare the data sets.

Ans: (A) Since the systolic and diastolic blood pressures measure different characteristics, a comparison of the measures of center doesn't make sense.

What else might be better?

- A. Because the data are matched, it would make more sense to investigate any outliers that do not fit the pattern of the other observations.
- B. Since measures of center would not be appropriate, it would make more sense to talk about the minimum and maximum values for each data set.
- C. Because the data are matched, it would make more sense to investigate whether there is an association or correlation between the two blood pressures.
- D. Since measures of center are appropriate, there would not be any better statistic to use in comparing the data sets.

Ans: C) Because the data are matched, it would make more sense to investigate whether there is an association or correlation between the two blood pressures.

9) The following are the ratings of males by females in an experiment involving speed dating. Use the given data to construct a boxplot and identify the 5-number summary.

| | | | | | | | | | | | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|---|---|---|---|-----|-----|---|
| 1 | 1 | 1.5 | 1.5 | 2.5 | 2.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 4 | 5 | 5 | 5 | 5 | 6 | 6.5 | 6.5 | 7 |
|---|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|---|---|---|---|-----|-----|---|

The 5-number summary is 1, 2.5, 3.5, 5, and 7.5.

Where

1 = minimum value

2.5 = 1st Quartile

3.5 = Median or 2nd Quartile

5 = 3rd Quartile

7.5 = Maximum Value

Boxplot:



10) In an experiment, college students were given either four quarters or a \$1 bill and they could either keep the money or spend it on gum. The results are summarized in the table. Complete parts (a) through (c) below.

| | Purchased Gum | Kept the Money |
|------------------------------|---------------|----------------|
| Students Given Four Quarters | 27 | 19 |
| Students Given a \$1 Bill | 11 | 34 |

- a. Find the probability of randomly selecting a student who spent the money, given that the student was given four quarters.
The probability is $=27/(27+19)=0.587$.
- b. Find the probability of randomly selecting a student who kept the money, given that the student was given four quarters.
The probability is $=19/(27+19)=0.413$.
- c. What do the preceding results suggest?
- A. A student given four quarters is more likely to have spent the money than a student given a \$1 bill.
 - B. A student given four quarters is more likely to have kept the money.
 - C. A student given four quarters is more likely to have kept the money.
 - D. A student given four quarters is more likely to have kept the money than a student given a \$1 bill.
- Answer : B. A student given four quarters is more likely to have spent the money.