

College Algebra ACC Unit 12 Review

1. What is the probability of drawing a red king then a black jack then an ace in that order? You choose the cards with replacement? Without replacement?

W/R  $\frac{2}{52} \cdot \frac{2}{52} \cdot \frac{4}{52} = \frac{1}{26} \cdot \frac{1}{26} \cdot \frac{1}{13} = \frac{1}{8788}$

W/O R  $\frac{2}{52} \cdot \frac{1}{51} \cdot \frac{4}{50} = \frac{1}{26} \cdot \frac{1}{51} \cdot \frac{2}{25} = \frac{2}{16575}$

2. Identify the potential outlier(s) in this set. 17, 15, 25, 16, 15, 9, 18, 16

9, 25

3. Without a calculator, compute the mean, median, mode, standard deviation  $Q_1$ ,  $Q_3$ , and spread (range) for this data.

(FYI  $\sqrt{\frac{66}{9}} \approx 2.7$ )

1, 1, 2, 2, 3, 4, 5, 6, 7, 9, 10

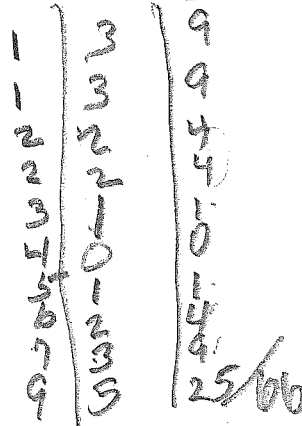
$\bar{x} = \frac{40}{10} = 4$

Med = 3.5  
Mode 1, 2

$Q_1 = 2$

$Q_3 = 6$

spread  $6 - 1 = 5$



$s = \sqrt{\frac{66}{9}} \approx 2.7$

For 4-6 identify the sampling method.

4. Two class representatives chosen by drawing names for a hat. random

5. Polling every 50<sup>th</sup> person in the phone book. systematic

6. The city council is trying to determine if there is support for a new bus terminal. They poll the first 200 people who enter the old bus station. convenience

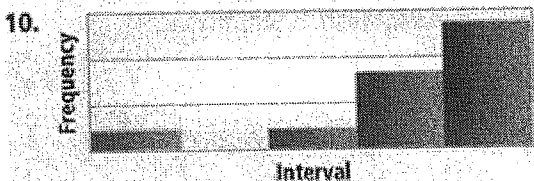
For 7-9, identify any bias in the question.

7. Do you think that the cafeteria food is slop? loaded

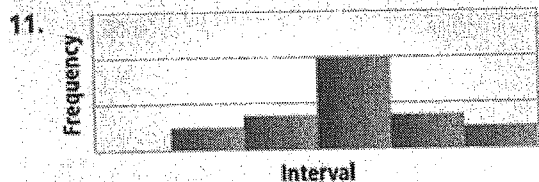
8. Don't you agree that the ABC schedule is wonderful? leading

9. Are you in favor of painting the school gold? no bias

Tell whether each histogram is uniform, symmetric, or skewed.



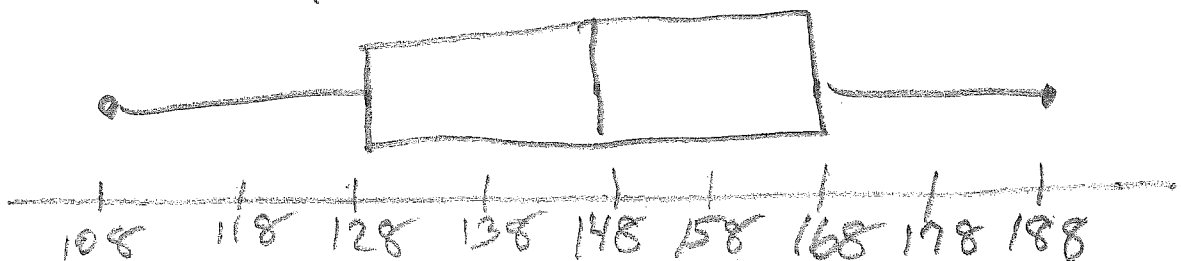
skewed



Symmetric

12. Make a box and whiskers plot for the data below. List  $Q_1$ ,  $Q_3$ , median, maximum, and minimum.

~~125 117 174 131 142 108 188 162 155 167 129 133 147 175 150~~  
 108 117 125 129 131 133 142 147 150 155 162 167 174 175 188  
 Med 147  $Q_1$  129  $Q_3$  167 max 188 min 108



13. A test has a mean of 82 with a standard deviation of 2.4. What is the z-score of a student who scores a 90? What is the actual score of a student with a z-score of -1.5?

$$Z = \frac{90 - 82}{2.4} \approx 3.3$$

$$\begin{aligned} -1.5 &= \frac{X - 82}{2.4} \\ -3.6 &= X - 82 \\ \underline{78.4} &= X \end{aligned}$$

14. A consumer research company survey 38 College Algebra students and determined that 25 of them were "happy, happy, happy" with the TV show, Duck Dynasty. Compute the sample proportion, the margin of error, and the 95% confidence level for the population proportion.

$$p = \frac{25}{38} = 65.8\%$$

$$50.7\% \leq p \leq 80.9\%$$

$$ME = 1.96 \sqrt{\frac{0.658(1-0.658)}{38}} = 15.1\%$$

15. A sample of test scores on the College Algebra Chapter 12 test yielded these rather depressing and disturbing results:

60, 53, 74, 35, 66, 54, 10, 99

Compute the sample mean, margin of error, and the 95% confidence level for the population mean.

$$\bar{X} = 56.4$$

$$S = 26.3$$

$$ME = 1.96 \cdot \frac{26.3}{\sqrt{8}} = 18.2$$

$$38.2 \leq \mu \leq 74.6$$

| Age of Respondent | Number of Groups |           |
|-------------------|------------------|-----------|
|                   | 0-4              | 5 or more |
| < 30              | 7                | 18        |
| ≥ 30              | 12               | 12        |

16. Find P(5 or more).  $\frac{30}{49} \approx .612$

17. Find P(5 or more | age < 30).  $\frac{18}{25} = .72$

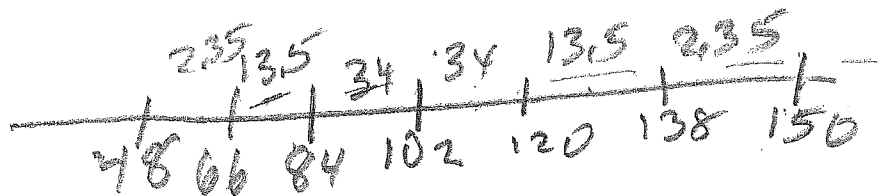
18. Find P(age ≥ 30 | 0-4)  $\frac{12}{19} = .632$

19. Use the graphing calculator to determine the mean, median,  $Q_1$ ,  $Q_3$ , and the mode. A veterinarian examines 9 cats. The weights in pounds of the cats are 13.4, 13.1, 10.4, 6.8, 11.4, 10.8, 13.4, 11.3, and 9.3. Which measure of central tendency best describes the data?

$\bar{x} = 11.1$   $s = 2.2$   $\min = 6.8$   $Q_1 = 9.85$   $\text{mod} = 11.3$   
 $\text{mode} = 13.4$   $\max = 13.4$   $Q_3 = 13.25$

Median seems to best describe most values,  
 Mean is impacted by the 6.8.

20. Suppose the time required for an auto shop to do a tune up is normally distributed, with a mean of 102 minutes and a standard deviation of 18 minutes. What is the probability that tune-up will take more than two hours? Under 66 minutes?



more than 2  $13.5 + 2.5 = 16\%$   
 less than 66  $2.5\%$