

Math 153 - Quiz 3

February 7, 2019

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) The salaries of the six employees at a local small business are shown below.

\$42,350, \$45,100, \$43,000, \$44,700, \$225,125, \$42,350

- (a) Compute the mean salary.

$$\begin{aligned} \sum x &= 442,625 \\ n &= 6 \end{aligned} \Rightarrow \bar{x} = \$73,770.83$$

- (b) Compute the median salary.

$$\frac{3^{RD} + 4^{TH}}{2} \text{ WHEN ARRANGED NUMERICALLY} = \frac{43000 + 44700}{2} = \$43,850$$

- (c) Which of your answers above is a more appropriate measure of center and why?

THE MEDIAN IS FAR MORE APPROPRIATE.

THE EXTREME VALUE (\$225,125) PULLS UP THE MEAN.

2. (1 point) The mean of 18 scores is 72.45. If a single new score of 92.5 is added to the collection, what is the new mean?

$$\frac{18(72.45) + 92.5}{19} \approx 73.5$$

3. (1 point) In the following stem-and-leaf plot, 4|5 means 4.5.

| | | | | | | | |
|---|--|---|---|---|---|---|---|
| 3 | | 1 | 6 | | | | |
| 4 | | 1 | 2 | 5 | | | |
| 5 | | 0 | 0 | 2 | 6 | 7 | 8 |
| 6 | | 3 | 8 | 8 | | | |
| 7 | | 0 | 4 | | | | |

Without computing the mean or the median, which one of these would you expect? Circle your choice and briefly explain.

- mean > median
- mean < median
- mean \approx median

THE DISTRIBUTION OF NUMBERS IS FAIRLY SYMMETRIC.

WITH THE LACK OF SKEWNESS,

I EXPECT MEAN \approx MEDIAN.

TAKE-HOME PORTION OF QUIZ 3. DUE TUESDAY.

4. (3 points) In a study of dogs' reaction times to a specific stimulus, an animal trainer obtained the following data.

MIDPOINTS ARE
2.6, 3.3, 4.0, 4.7, 5.4, 6.1

| Reaction time (seconds) | Frequency |
|-------------------------|-----------|
| 2.3-2.9 | 10 |
| 3.0-3.6 | 12 |
| 3.7-4.3 | 6 |
| 4.4-5.0 | 8 |
| 5.1-5.7 | 4 |
| 5.8-6.4 | 2 |

- (a) Estimate the mean reaction time by using class midpoints to compute a weighted mean.

$$\bar{X} \approx \frac{10(2.6) + 12(3.3) + 6(4.0) + 8(4.7) + 4(5.4) + 2(6.1)}{42}$$

$$= \frac{161}{42} \approx 3.83$$

- (b) Estimate the median reaction time by using class midpoints to compute a weighted median.

$$\text{MEDIAN} \approx \frac{21^{\text{ST}} + 22^{\text{ND}}}{2} = \frac{3.3 + 3.3}{2} = 3.3$$

- (c) Which was greater, your mean or median? Did you expect this? Explain.

MEAN > MEDIAN. | WOULD EXPECT THIS BECAUSE THE DISTRIBUTION IS SKEWED RIGHT.

5. (2 points) These data were obtained from tests of two different brands of battery.

Brand A: 638, 645, 636, 651, 639, 649, 654, 627, 644

Brand B: 519, 513, 477, 540, 415, 529, 571, 569, 536

Compute the CV (coefficient of variation) for each brand. Which brand produced data with greater spread?

BRAND A:

$$\bar{X} \approx 642.56$$

$$S \approx 8.44$$

$$CV = \frac{8.44}{642.56} \approx 1.3\%$$

BRAND B:

$$\bar{X} \approx 518.78$$

$$S \approx 48.28$$

$$CV \approx \frac{48.28}{518.78} \approx 9.3\%$$

BRAND B HAS MUCH GREATER SPREAD.