

1. Numerical summary of data.

- (a) (0.6, 0.8, 1.0, 1.2, 1.9)
- (b) Yes, because 1.9 is greater than $1.2 + 1.5(0.4) = 1.8$.
- (c) Note: $\sum x = 8.5$; $\sum x^2 = 10.15$; $n = 8$

$$\bar{x} = \frac{\sum x}{n} = \frac{8.5}{8} = 1.063$$

$$s = +\sqrt{\frac{\sum x^2 - (\sum x)^2/n}{n-1}} = +\sqrt{\frac{10.15 - (8.5)^2/8}{8-1}} = 0.400$$

2. Types of variables.

- (a) Quantitative / discrete
- (b) Quantitative / continuous
- (c) Categorical
- (d) Quantitative / discrete

3. Margin of error.

- (a) $\frac{823}{2500} \times 100 = 32.9$
 $\frac{1}{\sqrt{n}} \times 100 = \frac{1}{\sqrt{2500}} \times 100 = 2.0$

(b) Yes, because the true percentage can be within 32.9 ± 2.0 or (30.9, 34.9).

- (c) $\frac{1}{\sqrt{n}} \times 100 = 1.25 \Rightarrow n = 6400$

4. Bias in scientific studies.

An example of a study in which responses are not obtained from all participants.

5. Standardized score.

- (a) Approximately 68% of the scores would fall within 1 standard deviation:
 52 ± 13 or (39, 65)

- (b) $1.23 = \frac{x - 52}{13} \Rightarrow x = 68$

6. Experimental design.

- (a) The study is an experiment because the explanatory variable is manipulated.
- (b) Sheep do not have the same psychological reaction as humans do.
- (c) There is an ethical concern.