

Multiple Choice (3 points each)

Identify the choice that best completes the statement or answers the question.

1) A set of data has mean 66 and standard deviation 7. Find the z-score of the value 32.

$$\frac{32 - 66}{7} = -4.9$$

- a. 0.4 b. 4.9 c. -34 d. -4.9

Use the following information to answer questions 2 and 3:

A fishing tournament is sponsored by a local sporting goods store. The results of a fishing tournament, posted by the number of total pounds of fish caught, are normally distributed with a mean weight of 32.2 lb and a standard deviation of 5.8 lb.

2) Find the probability that a participant's total weight falls between 28.0 and 38.0 pounds.

mean = 32.2
 $\sigma = 5.8$

- a. 0.0866 c. -0.607
 b. 0.607 d. 0.019

normalcdf(28.0, 38, 32.2, 5.8)

3) If there are 50 participants, find the number of participants who finished with a total number of pounds of fish between 28.0 and 38.0 pounds.

- a. 28 participants c. 61 participants
 b. 30 participants d. 20 participants

.607(50) = 30

4) A set of data with a mean of 56 and a standard deviation of 3.3 is normally distributed. Find the values that are 2 standard deviations from the mean.

- a. -6.6 and 62.6 c. -6.6 and 6.6
 b. 6.6 and 62.6 d. 49.4 and 62.6

$56 - 2(3.3) = 62.6$
 $56 + 2(3.3) = 49.4$

5) The amount of Jen's monthly phone bill is normally distributed with a mean of \$66 and a standard deviation of \$12. What percentage of her phone bills are between \$30 and \$102?

- a. 99.99% b. 99.7% c. 68% d. 95%

$\mu = 66$
 $\sigma = 12$

normalcdf(30, 102, 66, 12)

6) A grocery store will only accept yellow onions that are at least 3 in. in diameter. A grower has a crop of onions with diameters that are normally distributed, with a mean diameter of 3.25 in. and a standard deviation of 0.25 in. What percent of the onions will be accepted by the grocery store?

- a. 34% b. 97.5% c. 84% d. 50%

$\mu = 3.25$ $\sigma = .25$

Invsorm(3, 1e99, 3.25, .2)

7) A study session was held in the school library the night before the Statistics test. The instructor lists the students who attended the session and compares their scores to the remaining Statistics students' scores. This is an example of...

- a. Experimental study c. Observational study
 b. Variable Study d. Population study

8) Over a 4-month period, among 30 people with bipolar disorder, patients who were given a high dose (10g/day) of omega-3 fats from fish oil improved more than those given a placebo. (Archives of General Psychiatry 56 [1999]: 407)
This is an example of...

- a. Variable study
b. Observational study
c. Population study
d. Experimental study

9) Divide the class into four groups (freshman, sophomore, junior and senior) and take a random sample of two students from each group.

- a. Convenience sample
b. Stratified random sample
c. Systematic random sample
d. Cluster sample

10) A data set has a mean 30 and a standard deviation of 3. Find the value that has a z-score of 2.67.

- a. 38.01
b. 40.03
c. 39.05
d. 42.04

$$2.67 = \frac{x - 30}{3}$$

$$\mu = 30 \quad \sigma = 3$$

11) You pay \$3.00 to play a card game. The dealer deals you one card. If the card is an ace, you get \$50. If you get anything else, you get nothing. What is your expected value for the game?

- a) \$2.69
b) \$0.85
c) \$1.08
d) \$8.84

$$50\left(\frac{4}{52}\right) - 3$$

12) Maria is playing a game. There are 3 marbles in a bag. If she chooses a pink marble, she will win \$15. If she chooses a blue marble, she will win \$80. If she chooses a yellow marble, she will lose \$50. What is the expected value of Maria's winnings from the game?

- a) \$15.00
b) \$48.33
c) \$20.00
d) \$53.33

$$15\left(\frac{1}{3}\right) + 80\left(\frac{1}{3}\right) - 50\left(\frac{1}{3}\right)$$

13) In basketball you can earn 3 points for a shot and 1 point for a free throw. If Sam's probability of getting a 3-point shot is 4/10 and 6/10 for a free throw, what is his expected value for the game?

- a) 3
b) 3.6
c) 1.8
d) 2

$$3(.4) + 1(.6)$$

14) On Jeopardy there are 5 categories: \$100, \$200, \$300, \$400, and \$500. Each of them has an equally likely chance of popping up. What is the expected value?

- a) \$260
b) \$300
c) \$280
d) \$320

$$\frac{1}{5}$$

15) At a raffle, 100 tickets are sold at \$1 each for 3 prizes of \$75, \$50, and \$25. You buy 1 ticket. What is the expected value of your gain?

- a) \$4.53
b) \$0.50
c) \$-1.53
d) \$1.50

$$75\left(\frac{1}{100}\right) + 50\left(\frac{1}{100}\right) + 25\left(\frac{1}{100}\right) - 1$$

16) Find the sample size required to achieve the given margin of error $\pm 3.2\%$.

- a) 245
b) 977
c) 976
d) 4

$$= .032 = \frac{1}{n} \quad .032\sqrt{n} = 1$$

$$\sqrt{n} = \frac{1}{.032}$$

$$n = \left(\frac{1}{.032}\right)^2$$

17) Find the margin of error for a survey that has a sample size of 3500

- a) $\pm .017\%$
b) $\pm 1.70\%$
c) $\pm 3.02\%$
d) $\pm 30.15\%$

$$\frac{1}{\sqrt{3500}} = \pm .017 = \pm 1.70\%$$

$$\sqrt{4(300)}$$

18) If your sample size is 300 and you wish to cut the margin of error in half, what will your new sample size be?

- a) 600 b) 150 c) 1200 d) 900

19) The News and Observer want's to interview teenagers across Wake County. Their surveys found that 52% of teenagers would like to see adults in their community provide a hotline for teens in crisis. The newspaper stated that "52% ± 4.5% of teenagers see a need for such a hotline." Based off of the margin of error they used, how many teenagers did they survey?

- a. 493 c. 500
b. 52 d. 494

$$\frac{1}{\sqrt{n}} = .045 \quad \frac{1}{.045} = \sqrt{n}$$

20) Find the probability of scoring below a 1200 on the SAT if the scores are normally distributed with a mean of 1450 and a standard deviation of 200

- a) .0501 b) .89 c) -.89 d) .106

normal dist (-1.099, 1200, 1450)
200

21) The heights of American men aged 18 to 24 are approximately normally distributed with mean 68 inches and standard deviation 2.5 inches. What is the shortest John can be if he wants to be in the 90th percentile of American men?

- a. 73" b. 65" c. 90" d. 71"

$$\mu = 68$$
$$\sigma = 2.5$$

22) Eric had a z-score of -1.3 on the end of course exam. Explain how he did.

- a. Eric scored below average.
b. Eric scored above average.
c. Eric scored the same as the average.
d. There is not enough information to determine how well he did.

In normal(9, 68, 2.5)

23) A sample of 120 employees of a company is selected, and the average age is found to be 37 years.

- a) Parameter b) Statistic

Matching: The owner of a health club with 1000 members is concerned about the friendliness of his staff. He decides to survey 50 members. What type of sampling does each of the following methods represent?

- | | | |
|-------------------|---|---|
| 24. Simple Random | B | a. Chose three workout classes and survey all members of those classes |
| 25. Systematic | D | b. Put each name on a single slip of paper. Place all of the slips in a hat and mix well. Draw one slip out and note the name. Continue picking until the names of 50 members are selected. |
| 26. Cluster | A | c. Ask the first 50 members who enter the club one morning. |
| 27. Stratified | E | d. Ask every 10 th person who enters the club one day. |
| 28. Convenience | C | e. Pick the names of 25 women out of a hat; then pick the names of 25 men out of a hat. |