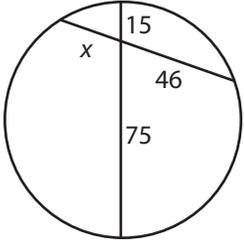Round all answers to the nearest tenth (unlike the answers shown).

1. Find the length of *x*.                                                                                                  *x* = 24

15

*x*

46

75

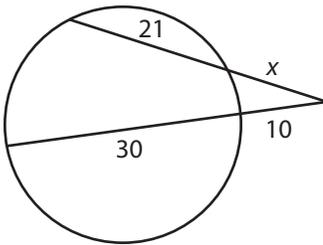2. Find the length of *x*.                                                                                                  *x* = 12

21

*x*

10

30
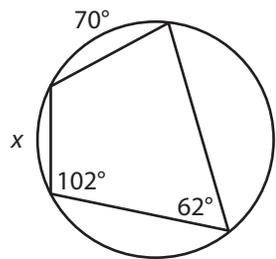
3. Find the area of a 110° sector of a circle with a radius of 15.                                        216

4. The diameter of the circle below is 20. Find the length of arc *x*.                              *x* = 9

70°

*x*

102°

62°

5. How many degrees is a central angle for which the corresponding arc is the same length as the radius? **57°**

Calculate the following without reducing or using decimals. Then use a complete sentence to explain exactly what the denominator represents in the solution, and another complete sentence for the numerator.

1. Find the probability that out of five 8-sided dice, more than three roll a 6 or a 7.                  $^{512}/_{32768}$

2. Find the probability that out of two random cards from a deck, one is the king of hearts.                  $^{2}/_{52}$

3. Davin and Ryan each draw two cards. What is the probability that Davin's cards are a pair, given Ryan's cards are a pair?                  $^{146}/_{2450}$

4. If the tiles A, E, E, L, M, N, S, and S are arranged in a random order, what is the probability they will spell either NAMELESS or SALESMEN?                  $^{2}/_{10080}$

5. There are four bags, each with three marbles. In one bag, none of the marbles are red, another bag has one red marble, another has two, and the last has three. If Olivia picks two random marbles from a random bag and the first one is red, what is the probability that the second one is red as well?                  $^{8}/_{12}$

1. Use the random sample { 76, 77, 85, 114 } of scores on the chapter 7 test to estimate the mean and standard deviation of all 26 of the tests. Show all steps.

$\bar{x} = 88$

$s = 17.8$

2. Mitchell intends to test the effectiveness of team quizzes in this class. Precisely state a possible dependent variable and possible levels of the independent variable.

3. College graduates have significantly higher salaries on average than adults who have not graduated college. Using the word *affect* or the word *effect* in complete sentences, explain why motivation is a confound in this scenario, and how it influences the conclusion that can be drawn about the relationship between college degrees and salary.

4. Last year I gave a pizza party for the fifth period Statistics class but not for the third period class, and then I compared their average scores on the test the following week. State one or more confounds that may have arisen by doing this as a between participants design, and state one or more confounds that could have arisen if I had instead done it as a within-participants design. Clarify which are which.

5. To test how much this class has contributed to students' critical thinking skills, Genevieve gives freshmen in this class and in other math classes a critical thinking test. Circle each of the following that are possible.

a) one-tailed test                    b) reject $H_0$                    c) type II error     **seven are possible**

d) random assignment              e) sequence effects                f) random selection

g) experimental design            h) causal relationship              i) within-participants

j) confounding variables          k) statistically significant        l) extraneous variables

For items with a provided answer, explain the answer in a complete sentence. For items requiring functions, look online as needed to find which functions to use, and clearly specify the arguments and output of each.

1. What level of measurement is score on this quiz?                                                                                  **ratio**

2. What function returns the number of empty cells in a given range?

3. Write code that will return the "*x* remaining", where *x* is the number of values in column D that are higher than the value of E1, or will return "DONE" if *x* is zero.

4. Create a clear graph to compare iPhone users to Android users as far as how much they like their phones. Make up reasonable results to put in the graph.                                                                       **bar graph**

5. Write code that will return the total value of all cells in column A for which the text in the cell to the right is "include," "included," or anything else beginning with "inc".

For items with a provided answer, explain the answer in one or more complete sentences.

1. If $\mu = 94$, is $P(\bar{x} > 80)$ greater if $n = 10$ or if $n = 15$?                                                                                    **15**

2. What type of test would be used to see if girls are more likely to take the SAT than boys are?

                                                                                                    ***z* test of two proportions**

3. Given $\sigma = 20$ and $H_0 =$ "The average score is not lower than 180," calculate the $p$ value for a sample of 30 scores averaging 175.5, and shade this area in a normal curve.                                                                **.11**

4. Ryan asks juniors whether they would rather have a smartphone or a car, and 79% say a smartphone. He calculates $p = .01$ for a one-tailed test. Use a complete sentence to precisely state what has a probability of 1%.

5. Calder hypothesizes that people will score lower on a timed multiplication test if they are the only person in the room with the experimenter while taking the test than if they are in a group of people taking the test. Scores for his alone sample are 21, 25, 28, 19, and 16. Scores for his group sample are 30, 25, 20, 20, 16, and 27. Use a calculator test or spreadsheet function to calculate $p$, and state Max's conclusion in a complete sentence in the context of what he is studying.