Sample Final Exam Introduction to Statistics - MAT 132

1. In a survey, 1465 internet users chose to respond to this question posted on a newspaper's electronic edition:

   Is news online as satisfying as print and TV news?

   52% of the respondents said yes.

   (a) Determine whether the study is an experimental or an observational study.

   (b) Identify the sample and the population.

   (c) Is the value 52% a statistic or a parameter?

   (d) Identify a major problem with the study.

2. A store manager kept track of the number of newspapers sold each week over a seven-week period. The results were as follows:

   $$81 \quad 71 \quad 202 \quad 113 \quad 269 \quad 248 \quad 242$$

   Find the 5-number summary for the data. Is the data discrete or continuous?

3. Consider the scatterplot given below.

   (a) Which of the following could be the value of r? -0.309, 0.675, 0.996, -0.996, -0.675

   (b) Given that the regression line has a slope of -0.128 and a y-intercept of -0.155, find the slope-intercept equation of the regression line.

   (c) Use the regression line to predict the y-value for the x-value 0.45.
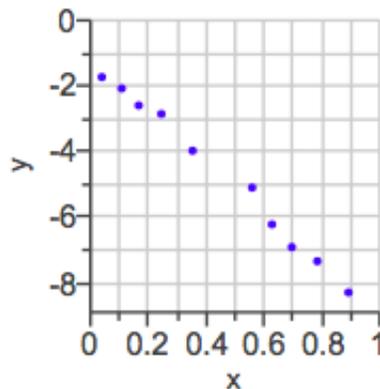
4. The table below describes the smoking habits of a group of 1156 asthma sufferers.

	Nonsmoker	Occasional Smoker	Regular Smoker	Heavy Smoker	Total
Men	431	50	71	49	601
Women	382	48	86	39	555
Total	813	98	157	88	1156

(a) If one of those people is randomly selected, find the probability that the person is a man or a heavy smoker. Round to three decimal places as needed.

(b) If one of those people is randomly selected, find the probability that the person is a regular smoker, given that the person is a woman.

5. A tennis player makes a successful first serve 51% of the time. Assume that each serve is independent of the others. If she serves 9 times, what is the probability that she gets at most 3 successful first serves in?

6. The overhead reach distances of adult females are normally distributed with a mean of 202.5 cm and a standard deviation of 8.3 cm. Find the probability that the mean for 25 randomly selected distances is greater than 200.30 cm.

7. A research institute poll asked respondents if they felt vulnerable to identity theft. In the poll, $n = 1068$ and $x = 542$ who said "yes". Use a 95% confidence level.

(a) Find the best point estimate of the population proportion p.

(b) Identify the value of the margin of error E.

(c) Construct the confidence interval.

(d) Which of the following statements correctly interprets the confidence interval?

  – There is a 95% chance that the true value of the population proportion will fall between the lower bound and the upper bound.

  – 95% of sample proportions will fall between the lower bound and the upper bound.

  – One has 95% confidence that the sample proportion is equal to the population proportion.

  – One has 95% confidence that the interval from the lower bound to the upper bound actually does contain the true value of the population proportion.

8. Consider a drug used to help prevent blood clots in certain patients. In clinical trials, among 5750 patients treated with this drug, 153 developed the adverse reaction of nausea. Use a 0.10 significance level to test the claim that less than 3% of users develop nausea.

(a) Identify the null and alternative hypotheses for this test.

(b) Identify the test statistic for this hypothesis test.

(c) Identify the P-value for this hypothesis test.

(d) Identify the conclusion for this hypothesis test.