Houston Community College
Statistics – M1342
Review for Final Exam

Determine whether the given value is a statistic or a parameter.

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

2) For the following data, approximate the mean miles per day.

Miles (per day)	Frequency
1–2	19
3–4	24
5–6	28
7–8	3
9–10	15

A) 4.8 B) 6.0 C) 4.3 D) 5.3

3) For the following data set, approximate the sample standard deviation.

Miles (per day)	Frequency
1–2	9
3–4	22
5–6	28
7–8	15
9–10	14

A) 2.4 B) 5.5 C) 5.9 D) 3.5

Find the indicated probability.

4) If a person is randomly selected, find the probability that his or her birthday is in May. Ignore leap years.
A) $\frac{31}{365}$ B) $\frac{1}{12}$ C) $\frac{1}{365}$ D) $\frac{1}{31}$

Solve the problem.

5) If you toss a fair coin 3 times, what is the probability of getting all heads?
A) $\frac{1}{4}$ B) $\frac{1}{8}$ C) $\frac{1}{2}$ D) $\frac{1}{16}$

6) Suppose you buy 1 ticket for $1 out of a lottery of 1,000 tickets where the prize for the one winning ticket is to be $500. What is your expected value?
A) –$1.00 B) $0.00 C) –$0.40 D) –$0.50

Find the indicated probability.

7) Suppose that in a certain town, 60 percent of the voters favor a new ballpark. Find the probability that among 8 voters questioned, exactly 5 of them favor the new ballpark.
A) 0.078 B) 0.279 C) 0.017 D) 0.219

8) In a recent survey, 80% of the community favored building a police substation in their neighborhood. If 15 citizens are chosen, what is the mean number favoring the substation?

A) 15 B) 12 C) 8 D) 10

If Z is a standard normal variable, find the probability.

9) $P(Z > 0.59)$

A) 0.7224 B) 0.2776 C) 0.2224 D) 0.2190

10) The probability that Z lies between –0.55 and 0.55

A) 0.4176 B) 0.9000 C) –0.9000 D) –0.4176

Assume that X has a normal distribution, and find the indicated probability.

11) The mean is $\mu = 137.0$ and the standard deviation is $\sigma = 5.3$.
Find $P(134.4 < X < 140.1)$.

A) 1.0311 B) 0.6242 C) 0.8138 D) 0.4069

Find the indicated probability.

12) The diameters of pencils produced by a certain machine are normally distributed with a mean of 0.30 inches and a standard deviation of 0.01 inches. What is the probability that the diameter of a randomly selected pencil will be less than 0.285 inches?

A) 0.4332 B) 0.0668 C) 0.0596 D) 0.9332

13) A nurse at a local hospital is interested in estimating the birth weight of infants. How large a sample must she select if she desires to be 95% confident that the true mean is within 3 ounces of the sample mean? The standard deviation of the birth weights is known to be 9 ounces.

A) 35 B) 6 C) 34 D) 5

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ.

14) A random sample of 94 light bulbs had a mean life of $\bar{x} = 452$ hours with a standard deviation of $s = 34$ hours. Construct a 90 percent confidence interval for the mean life, μ, of all light bulbs of this type.

A) (443, 461) B) (446, 458) C) (444, 460) D) (445, 459)

15) A university dean is interested in determining the proportion of students who receive some sort of financial aid. Rather than examine the records for all students, the dean randomly selects 200 students and finds that 118 of them are receiving financial aid. Use a 90% confidence interval to estimate the true proportion of students on financial aid.

A) .59 ± .057 B) .59 ± .004 C) .59 ± .398 D) .59 ± .002

Assume that the data has a normal distribution and the number of observations is greater than fifty. Find the critical z value used to test a null hypothesis.

16) $\alpha = 0.03$; H_0 is $\mu \geq 290$

A) ±2.17 B) –1.88 C) 1.88 D) ±1.88

Determine the decision criterion for rejecting the null hypothesis in the given hypothesis test; i.e., describe the values of the test statistic that would result in rejection of the null hypothesis.

17) Suppose you wish to test the claim that $\mu < 28.3$. Given a sample of $n = 86$ and a significance level of $\alpha = 0.05$, what criterion would be used for rejecting the null hypothesis?

A) Reject H_0 if test statistic < -1.96.

B) Reject H_0 if test statistic < 1.645.

C) Reject H_0 if test statistic > -1.645.

D) Reject H_0 if test statistic < -1.645.

Formulate the indicated conclusion in nontechnical terms. Be sure to address the original claim.

18) A skeptical paranormal researcher claims that the proportion of Americans that have seen a UFO, p, is less than 1 in every ten thousand. Assuming that a hypothesis test of the claim has been conducted and that the conclusion is failure to reject the null hypothesis, state the conclusion in nontechnical terms.

A) There is sufficient evidence to support the claim that the true proportion is less than 1 in ten thousand.

B) There is sufficient evidence to support the claim that the true proportion is greater than 1 in ten thousand.

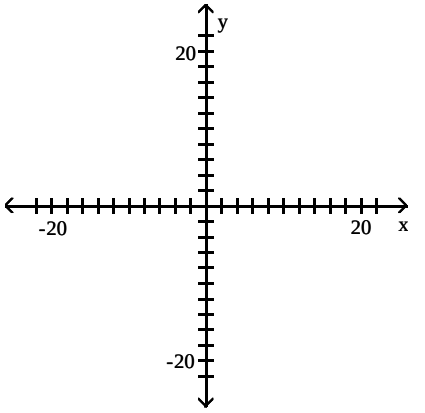
C) There is not sufficient evidence to support the claim that the true proportion is greater than 1 in ten thousand.

D) There is not sufficient evidence to support the claim that the true proportion is less than 1 in ten thousand.

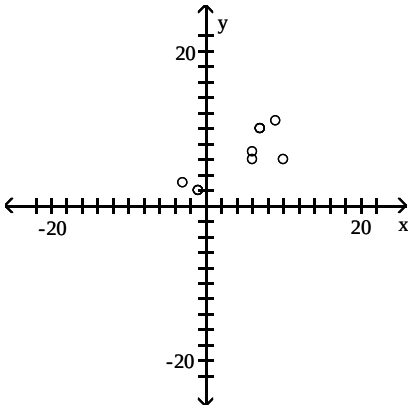
Construct a scatter diagram for the given data.

19)

x	–1	6	9	7	7	10	6	–3	–1
y	2	7	11	10	10	6	6	3	2



A)



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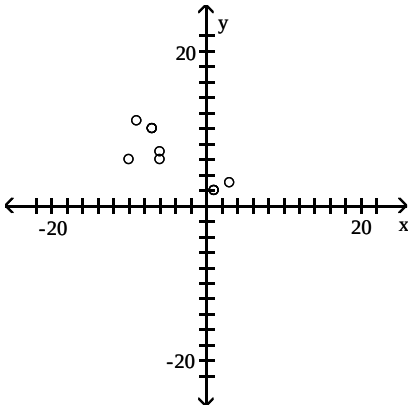
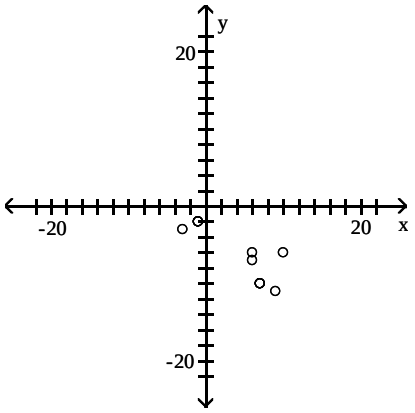
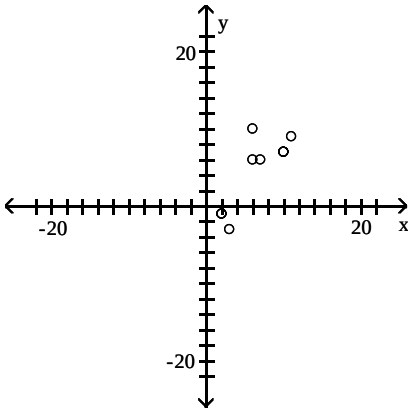


C)



D)



20) Is there a linear relationship in the above data?

A) Yes, a weak negative linear relationship.

B) Yes, a strong positive linear relationship.

C) Yes, a strong negative linear relationship.

D) No.

E) Yes, a weak positive linear relationship.

Find the value of the linear correlation coefficient r.

21) The paired data below consist of the test scores of 6 randomly selected students and the number of hours they studied for the test.

Hours	5	10	4	6	10	9
Score	64	86	69	86	59	87

A) –0.224 B) 0.678 C) 0.224 D) –0.678

Use the given data to find the equation of the regression line. Round the final values to three significant digits, if necessary.

22)

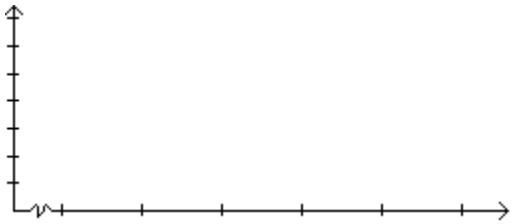
x	24	26	28	30	32
y	15	13	20	16	24

A) $\hat{y} = -11.8 + 0.950x$ B) $\hat{y} = 11.8 + 0.950x$ C) $\hat{y} = 11.8 + 1.05x$ D) $\hat{y} = -11.8 + 1.05x$

Construct the specified histogram.

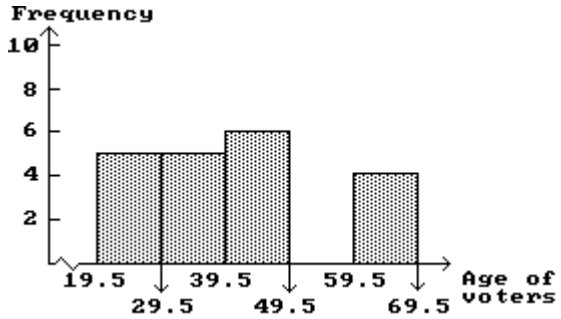
23) In a survey, 20 voters were asked their age. The results are summarized in the frequency table below. Construct a histogram corresponding to the frequency table.

AGE OF VOTER	NUMBER OF VOTERS
20–29	5
30–39	5
40–49	6
50–59	0
60–69	4



24) A fast food outlet claims that the mean waiting time in line is less than 3 minutes. A random sample of 60 customers has a mean of 2.9 minutes with a standard deviation of 0.6 minute. If $\alpha = 0.05$, test the fast food outlet's claim .

1) B
2) A
3) A
4) A
5) B
6) D
7) B
8) B
9) B
10) A
11) D
12) B
13) A
14) B
15) A
16) B
17) D
18) D
19) A
20) B
21) C
22) D
23)



24) P–value = 0.0985, $P > \alpha$, fail to reject H_0; There is not sufficient evidence to support the claim that the mean waiting time is less than 3.5 minutes.