Math 1530 Final Exam Spring 2012

Name _____

Section # _____

Instructor _____

There are five possible responses to each of the following multiple choice questions. There is only one "BEST" answer. Be sure to read all possible choices before selecting your answer. You may mark on this examination. You can use a calculator but a calculator manual cannot be used.

Form A

1. Which of these questions from the spring 2012 MATH1530 class survey produced variables that are quantitative? (The possible responses are after each question.)

   i. How often do you recycle? (Always, Most of the time, About half the time, Once in a while, Never)

   ii. How much money did you spend on your last meal? (in dollars)

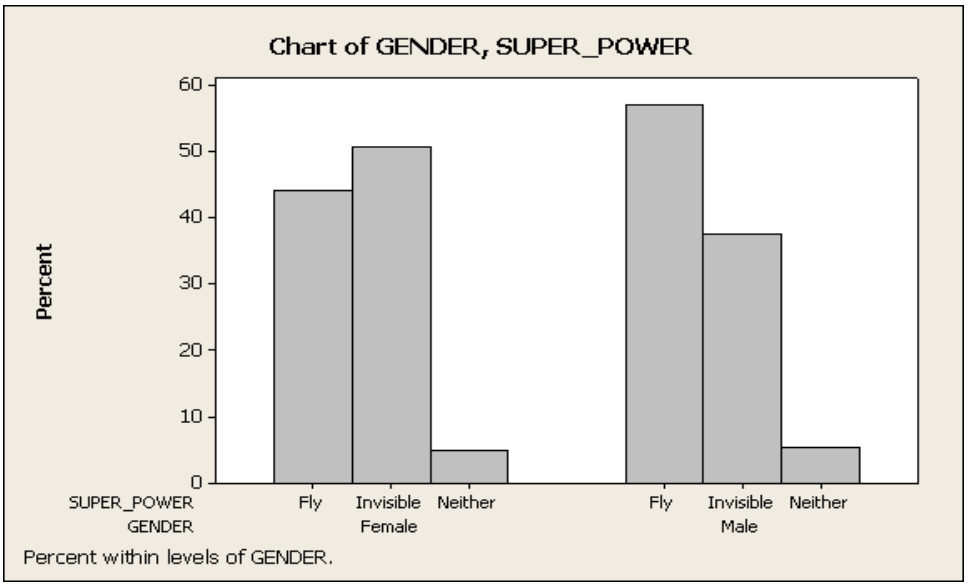
   iii. When is your birthday? (MONTH_BIRTH: Month; DAY_ BIRTH: Day)

   iv. On average, how much time do you spend per day on academic assignments? (in hours)

   v. Which one of the following is your favorite color or at least close to it? (green, red, orange, silver, white, blue, yellow, black)

   (A) ii, iii, iv (B) ii, iii (C) ii, iv (D) i, iii, v (E) i, v.

   Use the following for the next 2 questions. The spring 2012 MATH1530 class survey asked for your opinion on superhero status. The question was "If you had superhero status, would you rather be able to fly or be invisible?" Three options were given: Fly, Invisible, Neither.The Minitab bar graph shows the conditional distributions of superpower given gender for all students that responded to this question.



2. Approximately what percent of the females responded "Fly" on superhero status?

   (A) About 44% (B) About 57% (C) About 50% (D) About 38% (E) Unable to determine from the graph.

3. Which of the following is a true statement?

   (A) The bar graphs are bimodal.

   (B) There is a gap between the bar graphs which means we may have outliers.

   (C) It appears that both graphs are skewed right.

   (D) Overall, it appears that a larger percent of males would rather be able to fly than females do.

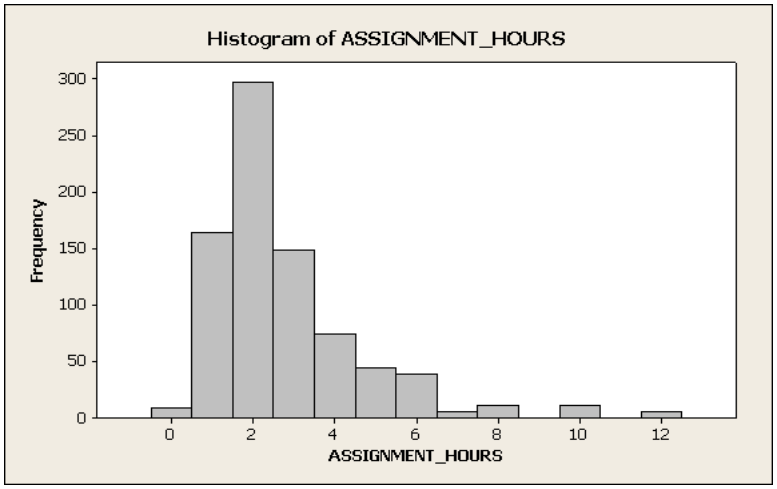
   (E) Side-by-side boxplots would be a better display to compare the responses of the females and the males.

4. The table below represents the student responses from the spring 2012 MATH1530 class survey to the month of their birthday. Which type of graph is appropriate for these data?

Month of Birthday	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Count	69	70	69	72	55	67	79	71	71	61	74	65

(A) Bar graph (B) Histogram (C) Stem plot (D) Scatterplot (E) Boxplot

Use the following for the next 3 questions. The histogram and descriptive statistics below summarize the student responses from the spring 2012 MATH1530 class survey to the question "On average, how much time (in hours) do you spend per day on academic assignments?"

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---------------------------------------------------------------------------------------------------
Descriptive Statistics: ASSIGNMENT_HOURS

Variable            N  N*    Mean  SE Mean   StDev  Minimum      Q1  Median     Q3  Maximum
ASSIGNMENT_HOURS  809  14  2.7533   0.0670  1.9047   0.0000  2.0000  2.0000 3.0000  12.0000
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5. Which of the following best describes the shape of the distribution?

(A) It is impossible to describe the shape because the median and Q_1 are the same.
(B) The data are strongly skewed right with some outliers.
(C) The data seems to be bimodal.
(D) There is only one outlier and it is 12.
(E) The data are strongly skewed left with some outliers.

6. About what percent of the students spend at least 3 hours per day on academic assignments on average?

(A) 75%
(B) 25%
(C) 50%
(D) $z = \dfrac{3 - 2.7533}{1.9047} = .13$ (Area under Normal Curve = 51.17%)
(E) Cannot be determined based on the information provided.

7. Which of the following numerical measures should be used to describe the distribution of this data?

(A) Min=0, Q_1= 2, $\bar{x} = 2.7533$, Q_3 = 3, Max=12.
(B) $\bar{x} = 2.7533$, $s = 1.9047$.
(C) Min=0, Q_1= 2, Median=2, Q_3 = 3, Max=12.
(D) Median = 2, $s = 1.9047$.
(E) Median = 2, $\bar{x} = 2.7533$.

Use the following for the next 2 questions. The data below are the scores of 30 students on a test (with a possible total score of 70).

28	52	63	9	30	50	49	39	52	56	46	59	23	52	38
42	52	45	65	35	67	54	34	26	31	47	57	69	47	55

8. Which of the following best describes the distribution?

   (A) The distribution is bimodal.

   (B) The distribution is skewed to the right.

   (C) The distribution is roughly symmetric.

   (D) The distribution is skewed to the left.

   (E) It is impossible to describe the distribution without a histogram.

9. What is the median score of these 30 students?

   (A) 40 (B) 38 (C) 48 (D) 42 (E) 52

10. In a small town, a few business owners make millions of dollars a year whereas most people in the town make less than $30,000. If we would produce a histogram for the amount of money the people make, which option would best describe the shape of the histogram?

    (A) skewed to the left

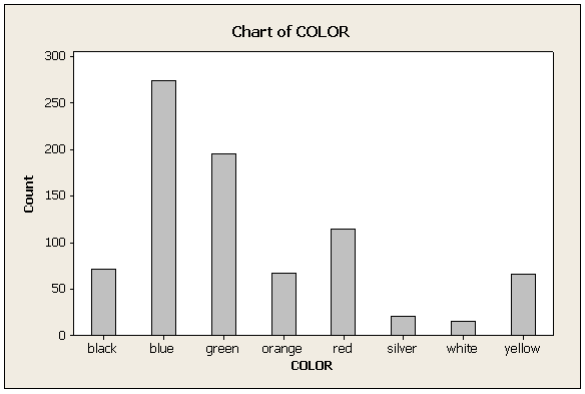
    (B) skewed to the right

    (C) symmetric

    (D) bell-shaped

    (E) all the bars will be of the same height

11. In the spring 2012 MATH1530 class survey, students were asked to choose one of the listed responses to the question "Which one of the following is your favorite color or at least close to it? " The bar graph below displays the distribution of students' favorite colors.



Which of the following is an accurate statement of the graph?

(A) The bar graph is skewed to the right.

(B) The bar graph is multimodal.

(C) It appears that blue is the favorite color.

(D) The center of the graph is approximately "red".

(E) All of the above.

12. There are 100 individuals from each of these groups according to dietary habits: omnivorous (eat every thing), eat meats except red meat, vegetarians, vegans. The cholesterol level was measured and recorded for each individual. To compare the cholesterol level for the four groups, what type of graph is appropriate?

    (A) Pie chart (B) Stacked bar charts (C) Histogram (D) Side-by-side boxplots (E) Scatterplots

13. For which of these pairs of variables would it NOT make sense to calculate the correlation coefficient?

(A) Height(in) and weight(lb)

(B) Height(in) and length of foot(in)

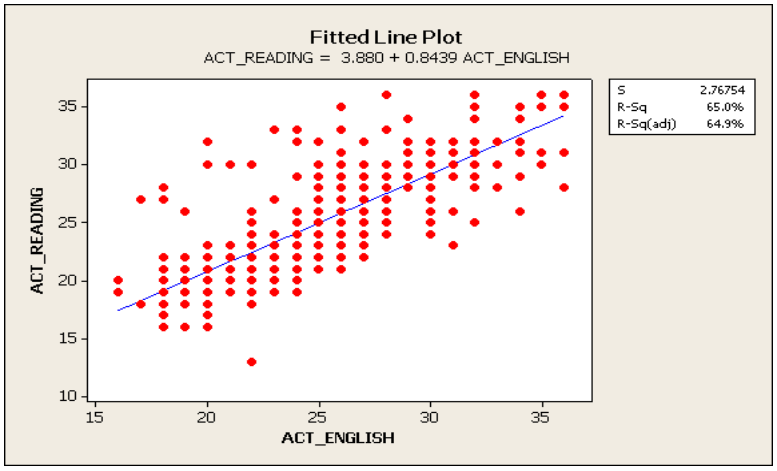
(C) Cholesterol(mg/L) and gender

(D) Cholesterol(mg/L) and age

(E) Glucose (mg/L) and cholesterol (mg/L)

Use the following for the next 3 questions. The spring 2012 MATH1530 class survey asked students to give their ACT scores (English, Math, Reading, and Science). Can we predict the ACT reading score of an ETSU student by knowing the ACT English score? The observations and the least-squares regression line appear in the scatterplot. The correlation between the two variables is $r = 0.806$ and the least-squares regression line for predicting the *ACT reading score* of a student from *ACT English score* is

$$\texttt{ACT Reading score} = 3.88 + .8439 \times \texttt{ACT English score}.$$



14. Which of the following best describes the relationship between ACT English score and ACT Reading score?

(A) There seems to be a strong negative linear relationship between the two variables driven with possible outliers.

(B) There seems to be a strong positive linear relationship between the two variables with possible outliers.

(C) The association is very weak.

(D) The average ACT scores on English and reading are around 24.7.

(E) Since $r = 0.806$, we know that the ACT scores on English and reading are almost the same for each student.

15. Which of the following is the correct interpretation of the slope of the least-squares regression line?

(A) As ACT English score increases by 1, ACT reading score will increase by about 0.8439 on the average.

(B) As ACT reading score increases by 1, ACT English score will increase by about 0.8439 on the average.

(C) Since the correlation is 0.806, ACT reading score increases by about 80.6% on the average.

(D) The ACT reading score is about 3.88 more than ACT English score on the average.

(E) As ACT English score increases by 1, ACT reading score will increase by about 3.88 on the average.

16. Use the least-squares regression line to predict ACT reading score when a student has a ACT English score of 20.

(A) 3.88

(B) $(.8439)(20) = 17$

(C) $.806^2 * 20 = 13$

(D) $3.88 + (.8439)(20) = 21$

(E) Any value between 13 and 36.

17. A survey of the worlds nations in 2004 shows a strong positive correlation between percentage of the country using cell phones and life expectancy in years at birth. The observed correlation is most likely due to

    (A) cause and effect (cell phones are good for your health).

    (B) the effect of a lurking variable, such as general economic conditions.

    (C) a mistake, since the correlation must be negative.

    (D) "reverse" cause and effect (longer life causes more people to use cell phones).

    (E) a large R^2.

18. The Pepsi Company designed a study to demonstrate that Coke drinkers prefer Pepsi when they taste both colas blindfolded. The subjects, all people who said that they were Coke drinkers, tasted both colas using cups without brand identification and said which they liked better. Because responses depend on which cola is tasted first, the order of tasting was chosen at random for each subject. This study is

    (A) an observational study.
    (B) a stratified random sample.
    (C) a double blind experiment.
    (D) a completely randomized experiment.
    (E) a matched pairs experiment.

    Use the following for the next 3 questions. A researcher is interested in investigating the relationship between sugar consumption and weight gain for high school students. Fifteen volunteers were randomly assigned to one of two groups. The first group contained six volunteers who were put on a low sugar diet. The second group consisting of the remaining nine volunteers was put on a diet with sugar constituting approximately 15% of their diet. After eight weeks, the change in weight was recorded for each of the volunteers.

19. The response variable in this study is

    (A) the percentage of sugar in the diet.
    (B) the change in weight.
    (C) the eight-week time period.
    (D) the assignment to groups.
    (E) the fifteen volunteers.

20. The factor in this study is

    (A) the percentage of sugar in the diet.
    (B) the change in weight.
    (C) the eight-week time period.
    (D) the assignment to groups.
    (E) the fifteen volunteers.

21. *Who* are the individuals in this study?

    (A) The researcher
    (B) The fifteen volunteers.
    (C) The percentage of sugar in the diet.
    (D) The change in weight.
    (E) The eight-week time period.

22. A question posted on a web site asked visitors to the site to say whether they thought marijuana should be legally available. Are there any potential sources of bias and what conclusions can be drawn from this survey?

    (A) We would need to know the margin of error before we can draw a conclusion from this survey.

    (B) No. The results will produce a yes or no response and the binomial distribution can be used to draw conclusions about the population.

    (C) We should be able estimate the percentage of the population who think marijuana should be legalized from this survey.

    (D) Yes. The sample size needs to be large to be able draw conclusions about the population.

    (E) Yes since this is a voluntary response sample. Those who visit the site and respond may be predisposed to a particular answer and it would be difficult to generalize the results to the population.

23. In a test of roughly 200 men and women, those with moderately high blood pressure (averaging 164/89 mm Hg) did worse on tests of memory and reaction time than those with normal blood pressure. (*Hypertension* 36 [2000]: 1079) What conclusion can be drawn from this study?

    (A) A two-sample t-test should be used to analyze and prove that high blood pressure causes memory and reaction time problems.

    (B) This is an experiment with factors memory and reaction time.

    (C) The correlation between high blood pressure and memory and reaction time must be close to -1.

    (D) Since this is an experiment the researchers can conclude that high blood pressure has an effect on tests of memory and reaction time.

    (E) Since this is an observational study and there was no random assignment, the researchers should not make claims that high blood pressure caused subjects to do worse on memory and reaction time tests.

24. Commercial airplanes have an excellent safety record. Nevertheless, there are crashes occasionally, with the loss of many lives. In the weeks following a crash, airlines often report a drop in the number of passengers, probably because people are afraid to risk flying. A travel agent suggests that, since the law of large numbers makes it highly unlikely to have two plane crashes within a few weeks of each other, flying soon after a crash is the safest time. What do you think?

    (A) There is no "Law of Large Numbers". If crashes are independent, it makes no difference. If these crashes were due to problems with the aircraft, another crash may be more likely; however, increased maintenance vigilance may lessen the chance of another crash.

    (B) The travel agent has correctly interpreted the law of large numbers by concluding the risk of crashing will decrease since the catastrophic event had just occurred.

    (C) It was overdue for a crash and now we will not see another crash for a long time because of the law of averages.

    (D) If crashes are independent then the probability of another crash will be even lower in the next few weeks.

    (E) The good safety record is probably due to luck and so the chance of another crash is fairly likely.

Use the following for the next 3 questions. The spring 2012 MATH1530 class survey asked for gender type and "If you had superhero status, would you rather be able to fly or be invisible?" The distribution of counts is shown below in the table. Choose a student at random from this group.

Tabulated statistics: Gender, SUPER_POWER

Rows: Gender Columns: SUPER_POWER

	Fly	Invisible	Neither	All
Female	216	248	24	488
Male	191	126	18	335
All	407	374	42	823

Cell Contents: Count

25. The probability that the student was a male and would rather be invisible is

    (A) 126/374 or .3369 (B) 126/335 or .3761 (C) 335/823 or .4070 (D) 374/823 or .4544 (E) 126/823 or .1531

26. The conditional probability that the student was a male, given that the student would rather be invisible is

    (A) 126/374 or .3369 (B) 126/335 or .3761 (C) 335/823 or .4070 (D) 374/823 or .4544 (E) 126/823 or .1531

27. The conditional probability that the student would rather be invisible, given that the student was a male, is

    (A) 126/374 or .3369 (B) 126/335 or .3761 (C) 335/823 or .4070 (D) 374/823 or .4544 (E) 126/823 or .1531

28. It is believed that 20% of Americans do not have any health insurance. Suppose this is true and a simple random sample of 7 Americans is taken. What is the probability that at most three people in the sample have no health insurance?

    (A) $0.2^3 = 0.008$ (B) 3/7 =0.4286 (C) 0.8520 (D) 0.1147 (E) 0.9667

29. An automobile insurer has found that repair claims have a mean of \$1520 and a standard deviation of \$770. Suppose that the next 100 claims can be regarded as a random sample from the long-run claims process. The probability that the average amount of the costs of the 100 claims is less than \$1500 is

    (A) 0.3974. (B) 0.6026. (C) 0.4880. (D) 0.0047. (E) 0.2574

30. I toss a coin and observe whether it lands heads up or tails up. Suppose the coin is fair, i.e., the probability of heads is 1/2 and the probability of tails is 1/2. This means

    (A) every occurrence of a head must be balanced by a tail in one of the next two or three tosses.

    (B) regardless of the number of tosses, half will be heads and half tails.

    (C) the proportion of heads is always very different from 1/2 for a few tosses but will be closer to 1/2 for many tosses.

    (D) if I toss the coin many, many times, the proportion of heads will be approximately 1/2, and this proportion will tend to get closer and closer to 1/2 as the number of tosses increases.

    (E) if I toss the coin a few times, the proportion of heads will be approximately 1/2, and this proportion will tend to get farther and farther from 1/2 as the number of tosses increases.

Use the following for the next 3 questions. The time (in number of days) until maturity of a certain variety of tomato plant is normally distributed with mean μ and standard deviation $\sigma = 2.4$. In a study, a simple random sample of four plants of this variety was selected and the time until maturity was measured. The four times, in days, are: 63, 69, 62, 66.

31. Based on these data, a 99% confidence interval for μ, in days, is

    (A) 65.00 ± 1.55. (B) 65.00 ± 2.35. (C) 65.00 ± 3.09. (D) 65.00 ± 4.07. (E) 65.00 ± 7.2.

32. Which of the following is the best interpretation of the above calculated confidence interval?

    (A) There is a 99% probability that the true μ for all tomato plants of this variety is within the 95% confidence interval.

    (B) The time until maturity of 99% of all tomato plants of this variety is within the 95% confidence interval.

    (C) With 99% confidence, the population mean time until maturity of this variety of tomato plant is within the calculated interval.

    (D) A different sample of the same size and same $C = 99\%$ would have the exact same confidence interval as the first sample did.

    (E) We are certain the true value of μ is in the interval that was calculated.

33. If I wanted the margin of error for the 99% confidence interval to be $\pm$ 1 inch, the size of a simple random sample should be at least

    (A) 7. (B) 2. (C) 12. (D) 39. (E) 16.

Use the following for the next 2 questions. Suppose we are testing the null hypothesis $H_0 : \mu = 20$ and the alternative $H_a : \mu < 20$, for a normal population with $\sigma = 6$. A random sample of nine observations are drawn from the population, and we find the sample mean of these observations is $\bar{x} = 17$.

34. The P-value is closest to

    (A) 0.1336. (B) 0.0013 (C) .0026 (D) .3085. (E) 0.0668.

35. What does the above P-value mean in this context?

    (A) It is the probability that the null hypothesis is true.

    (B) It is the probability that the alternative hypothesis is true.

    (C) It is the probability of type I error.

    (D) It is the probability of type II error.

    (E) It is the probability of obtaining a sample mean of 17 or less in a random sample of size 9 when the population mean is 20.

Use the following for the next 3 questions. The spring 2011 and spring 2012 Math 1530 class survey asked "When a person has a disease that cannot be cured, do you think doctors should be allowed by law to end the patients life by some painless means if the patient and his/her family request it?" The proportion of spring 2011 students who answer "Yes" was 55%. We would like to know if current ETSU students have a different opinion on this than what the 2011 student survey found. The following table is the summary information from the spring 2012 survey.

END_LIFE	Count
DON'T KNOW	118
NO	218
YES	489
N=	825

36. What is the numerical value of the statistic that estimates the proportion of current ETSU students who would answer "Yes" to the question?

(A) 0.55 (B) 0.59 (C) 825 (D) 489 (E) 453

37. The hypotheses for a test to answer this question are

(A) $H_0 : \mu = 0.55, H_a : \mu \neq 0.55$ (C) $H_0 : \hat{p} = 0.55, H_a : \hat{p} > 0.55$

(B) $H_0 : p = 0.55, H_a : p > 0.55$ (D) $H_0 : \hat{p} = 0.55, H_a : \hat{p} \neq 0.55$

(E) $H_0 : p = 0.55, H_a : p \neq 0.55$

38. A one sample proportion test was performed and the P-value is 0.014. Using the significance level $\alpha = 0.05$ to draw conclusions and interpret it relative to the survey conducted in 2011. Comment on any assumptions that are needed for your conclusions to be accurate.

(A) Reject H_0 and conclude that the percentage of all ETSU students who believe that doctors should be allowed by law to end the patients life by some painless means if the patient and his/her family request is 55%. It is important that the data follow the Normal distribution and there are no outliers.

(B) Reject H_0 since the P-value is small. However, we cannot trust our results because the sample size is small relative to the total student population.

(C) There is enough evidence to suggest that the proportion of current ETSU students who believe that doctors should be allowed by law to end the patients life by some painless means if the patient and his/her family request is different from the 2011 student survey. It is assumed that the students who responded to the survey represent all ETSU students.

(D) There is not enough evidence to suggest that the proportion of current ETSU students who believe that doctors should be allowed by law to end the patients life by some painless means if the patient and his/her family request is different from the 2011 student survey. The sample size is small relative to the total student population. Therefore, we cannot trust the results.

(E) Since the sample size is large $(n = 825)$, there is no need to worry about the assumptions and any small deviation of a sample proportion from 55% would be statistically significant.

39. In an USA criminal trial, the null hypothesis is that the defendant is innocent and the alternative hypothesis is that the defendant is guilty. Which of the following describes a Type I error?

(A) A not guilty verdict for a person who is innocent.

(B) A not guilty verdict for a person who is guilty.

(C) A guilty verdict for a person who is innocent.

(D) A guilty verdict for a person who is not innocent.

(E) Not enough information is provided to describe a Type I error.

Use the following for the next 2 questions. A snack food producer produces bags of peanuts labeled as containing 3 ounces. The actual weight of peanuts packaged in individual bags is Normally distributed with mean μ and standard deviation $\sigma = 0.2$ ounces. As part of quality control, n bags are selected randomly and their contents are weighed. The hypotheses of interest are $H_0 : \mu = 3$ ounces, $H_a : \mu \neq 3$ ounces.

40. If the inspector samples $n = 5000$ bags and observes a sample mean weight of $\bar{x} = 3.01$ ounces, the P-value is close to 0 (you don't need to verify this. It's true). Which of the following is correct?

    (A) The inspector will conclude that there is strong evidence that the mean weight of peanut bags is very different from 3 ounces.

    (B) We need a larger sample to determine that the mean weight for all peanut bags is very different from 3 ounces.

    (C) The P-value is close to 0 simply because we took such a large sample. After all, it's clear that the true mean weight for all peanut bags is not exactly 3 ounces. So while we may have evidence that the mean weight differs from 3 ounces, there's no evidence that it is far from 3 ounces.

    (D) The inspector will be making a mistake by concluding that the mean weight of peanut bags is different from 3 ounces.

    (E) The P-value must be much larger if a second sample of 5000 bags of peanuts is taken.

41. If the inspector samples $n = 25$ bags and observes a sample mean weight of $\bar{x} = 3.01$ ounces, the P-value is close to 0.8026 (you don't need to verify this. It's true). This result and the result in the previous question demonstrate that

    (A) when we take a large enough random sample, even very small difference will be statistically significant.

    (B) the measure of statistical significance (a P-value) depends heavily on the sample size.

    (C) practical significance is not the same thing as statistical significance.

    (D) for the same difference, the null hypothesis is easier to be rejected if the sample size is larger.

    (E) all the statements above are true.

42. The spring 2012 MATH1530 class survey asked: "How often do you recycle?" The options were: Always, Most of the time, About half the time, Once in a while, and Never. Do male and female students have the same habit on recycling? The Minitab output shows the two-way table and related information to answer this question.

Expected counts are printed below observed counts.

Gender	Always	Most of the time	About half the time	Once in a while	Never	Total
Female	45	82	94	211	57	489
	38	81.9	100.3	204.7	64.1	
Male	19	56	75	134	51	335
	26	56.1	68.7	140.3	43.9	
Total	64	138	169	345	108	824

Cell Contents: Count

Expected count

$$Chi - Square = 6.564, DF = 4, P - Value = 0.161$$

What is the correct conclusion of this analysis? (Use $\alpha = 0.05$.)

(A) The number of females who responded to the survey is statistically different from the number of males that responded to the survey. Therefore, any conclusion would be invalid.

(B) Based on the observed counts for "Never", it seems that males recycle more often than females.

(C) There does not appear to be strong evidence to suggest that females and males differ in their habit on recycling.

(D) There appears to be strong evidence to suggest that females and males differ in their habit on recycling.

(E) The data are statistically significant because the sample size is large.

43. Based on the spring 2012 MATH1530 class survey, we want to know if there is good evidence that all female ETSU students and all male ETSU students differ in their mean ACT score on Math? Assume that the students that responded to the survey represent all ETSU students. Below are outputs of four data analysis procedures from Minitab.

```
Output 1:
One-Sample T: ACT_MATH

Variable    N    Mean  StDev  SE Mean       95% CI
ACT_MATH  425  23.014  4.330    0.210  (22.601, 23.427)
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```
Output 2:
One-Sample T: Female

Variable    N    Mean  StDev  SE Mean       95% CI
Female    238  22.353  4.092    0.265  (21.830, 22.875)

One-Sample T: Male

Variable    N    Mean  StDev  SE Mean       95% CI
Male      187  23.856  4.486    0.328  (23.208, 24.503)
```

```
Output 3:
Paired T-Test and CI: Female, Male
Paired T for Female - Male

              N    Mean  StDev  SE Mean
Female      187  20.743  2.739    0.200
Male        187  23.856  4.486    0.328
Difference  187  -3.112  2.046    0.150

95% CI for mean difference: (-3.407, -2.817)
T-Test of mean difference = 0 (vs not = 0): T-Value = -20.80  P-Value = 0.000
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```
Output 4:
Two-Sample T-Test and CI: ACT_MATH, GENDER

GENDER    N   Mean  StDev  SE Mean
Female  238  22.35   4.09     0.27
Male    187  23.86   4.49     0.33

Difference = mu (Female) - mu (Male)
Estimate for difference:  -1.503
95% CI for difference:  (-2.332, -0.673)
T-Test of difference = 0 (vs not =): T-Value = -3.56  P-Value = 0.000  DF = 380
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Which of the following options answers the research question?

(A) Output 1; We are 95% confident that the mean ACT Math score for all ETSU students ranges from about 22.6 to 23.43. Since this interval doesn't contain 0, we conclude that all female students and all male ETSU students differ in their mean ACT Math score.

(B) Output 2; We are 95% confident that the mean ACT Math score for all ETSU female students is about 21.83 to 22.875. We are 95% confident that the mean ACT Math score for all ETSU male students is about 23.208 to 24.503. Since neither confidence interval contains 0, we conclude that the mean difference in ACT math score of all ETSU male and female students is much larger than 0.

(C) Output 3; There is evidence to suggest that that all female students and all male students differ in their mean ACT Math score.

(D) Output 4; A 95% confidence interval for the difference in the true mean ACT Math score is anywhere from -2.332 to -1.503. Since this interval doesn't contain 0, there appears to be good evidence to suggest that all ETSU female students and all ETSU male students differ in their mean ACT Math score.

(E) All outputs tell us to reject H_0. Hence, we can use any of them and the research question has been verified.

Binomial Probability Table

		p											
n	x	.01	.05	.10	.15	.20	.25	.30	1/3	.35	.40	.45	.50
1	0	0.9900	0.9500	0.9000	0.8500	0.8000	0.7500	0.7000	0.6667	0.6500	0.6000	0.5500	0.5000
	1	0.0100	0.0500	0.1000	0.1500	0.2000	0.2500	0.3000	0.3333	0.3500	0.4000	0.4500	0.5000
2	0	0.9801	0.9025	0.8100	0.7225	0.6400	0.5625	0.4900	0.4444	0.4225	0.3600	0.3025	0.2500
	1	0.0198	0.0950	0.1800	0.2550	0.3200	0.3750	0.4200	0.4444	0.4550	0.4800	0.4950	0.5000
	2	0.0001	0.0025	0.0100	0.0225	0.0400	0.0625	0.0900	0.1111	0.1225	0.1600	0.2025	0.2500
3	0	0.9703	0.8574	0.7290	0.6141	0.5120	0.4219	0.3430	0.2963	0.2746	0.2160	0.1664	0.1250
	1	0.0294	0.1354	0.2430	0.3251	0.3840	0.4219	0.4410	0.4444	0.4436	0.4320	0.4084	0.3750
	2	0.0003	0.0071	0.0270	0.0574	0.0960	0.1406	0.1890	0.2222	0.2389	0.2880	0.3341	0.3750
	3	0.0000	0.0001	0.0010	0.0034	0.0080	0.0156	0.0270	0.0370	0.0429	0.0640	0.0911	0.1250
4	0	0.9606	0.8145	0.6561	0.5220	0.4096	0.3164	0.2401	0.1975	0.1785	0.1296	0.0915	0.0625
	1	0.0388	0.1715	0.2916	0.3685	0.4096	0.4219	0.4116	0.3951	0.3845	0.3456	0.2995	0.2500
	2	0.0006	0.0135	0.0486	0.0975	0.1536	0.2109	0.2646	0.2963	0.3105	0.3456	0.3675	0.3750
	3	0.0000	0.0005	0.0036	0.0115	0.0256	0.0469	0.0756	0.0988	0.1115	0.1536	0.2005	0.2500
	4	0.0000	0.0000	0.0001	0.0005	0.0016	0.0039	0.0081	0.0123	0.0150	0.0256	0.0410	0.0625
5	0	0.9510	0.7738	0.5905	0.4437	0.3277	0.2373	0.1681	0.1317	0.1160	0.0778	0.0503	0.0313
	1	0.0480	0.2036	0.3280	0.3915	0.4096	0.3955	0.3601	0.3292	0.3124	0.2592	0.2059	0.1562
	2	0.0010	0.0214	0.0729	0.1382	0.2048	0.2637	0.3087	0.3292	0.3364	0.3456	0.3369	0.3125
	3	0.0000	0.0011	0.0081	0.0244	0.0512	0.0879	0.1323	0.1646	0.1811	0.2304	0.2757	0.3125
	4	0.0000	0.0000	0.0005	0.0022	0.0064	0.0146	0.0283	0.0412	0.0488	0.0768	0.1128	0.1562
	5	0.0000	0.0000	0.0000	0.0001	0.0003	0.0010	0.0024	0.0041	0.0053	0.0102	0.0185	0.0313
6	0	0.9415	0.7351	0.5314	0.3771	0.2621	0.1780	0.1176	0.0878	0.0754	0.0467	0.0277	0.0156
	1	0.0571	0.2321	0.3543	0.3993	0.3932	0.3560	0.3025	0.2634	0.2437	0.1866	0.1359	0.0938
	2	0.0014	0.0305	0.0984	0.1762	0.2458	0.2966	0.3241	0.3292	0.3280	0.3110	0.2780	0.2344
	3	0.0000	0.0021	0.0146	0.0415	0.0819	0.1318	0.1852	0.2195	0.2355	0.2765	0.3032	0.3125
	4	0.0000	0.0001	0.0012	0.0055	0.0154	0.0330	0.0595	0.0823	0.0951	0.1382	0.1861	0.2344
	5	0.0000	0.0000	0.0001	0.0004	0.0015	0.0044	0.0102	0.0165	0.0205	0.0369	0.0609	0.0938
	6	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0007	0.0014	0.0018	0.0041	0.0083	0.0156
7	0	0.9321	0.6983	0.4783	0.3206	0.2097	0.1335	0.0824	0.0585	0.0490	0.0280	0.0152	0.0078
	1	0.0659	0.2573	0.3720	0.3960	0.3670	0.3115	0.2471	0.2048	0.1848	0.1306	0.0872	0.0547
	2	0.0020	0.0406	0.1240	0.2097	0.2753	0.3115	0.3177	0.3073	0.2985	0.2613	0.2140	0.1641
	3	0.0000	0.0036	0.0230	0.0617	0.1147	0.1730	0.2269	0.2561	0.2679	0.2903	0.2918	0.2734
	4	0.0000	0.0002	0.0026	0.0109	0.0287	0.0577	0.0972	0.1280	0.1442	0.1935	0.2388	0.2734
	5	0.0000	0.0000	0.0002	0.0012	0.0043	0.0115	0.0250	0.0384	0.0466	0.0774	0.1172	0.1641
	6	0.0000	0.0000	0.0000	0.0001	0.0004	0.0013	0.0036	0.0064	0.0084	0.0172	0.0320	0.0547
	7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0005	0.0006	0.0016	0.0037	0.0078
8	0	0.9227	0.6634	0.4305	0.2725	0.1678	0.1001	0.0576	0.0390	0.0319	0.0168	0.0084	0.0039
	1	0.0746	0.2793	0.3826	0.3847	0.3355	0.2670	0.1977	0.1561	0.1373	0.0896	0.0548	0.0312
	2	0.0026	0.0515	0.1488	0.2376	0.2936	0.3115	0.2965	0.2731	0.2587	0.2090	0.1569	0.1094
	3	0.0001	0.0054	0.0331	0.0839	0.1468	0.2076	0.2541	0.2731	0.2786	0.2787	0.2568	0.2187
	4	0.0000	0.0004	0.0046	0.0185	0.0459	0.0865	0.1361	0.1707	0.1875	0.2322	0.2627	0.2734
	5	0.0000	0.0000	0.0004	0.0026	0.0092	0.0231	0.0467	0.0683	0.0808	0.1239	0.1719	0.2187
	6	0.0000	0.0000	0.0000	0.0002	0.0011	0.0038	0.0100	0.0171	0.0217	0.0413	0.0703	0.1094
	7	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004	0.0012	0.0024	0.0033	0.0079	0.0164	0.0312
	8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0002	0.0007	0.0017	0.0039

CONFIDENCE LEVEL	*TAIL AREA*	z^*
80%	0.1000	1.282
90%	0.0500	1.645
95%	0.0250	1.960
96%	0.0200	2.054
98%	0.0100	2.326
99%	0.0050	2.576
99.5%	0.0025	2.807