

Math 1530 Final Exam Spring 2013

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.

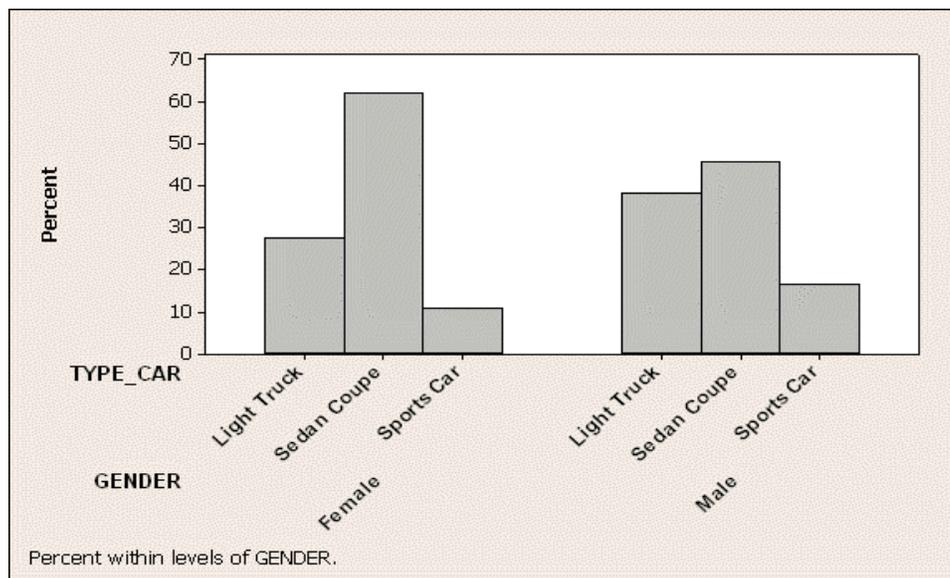
Form A

Please circle your answer to each question and fill the blank sheet. After you finish the exam, log into D2L and input your answers under the right quiz item. There are a total of 43 questions.

- If your test is Form A, take Quiz item *Final Form A*.
- If your test is Form B, take Quiz item *Final Form B*.
- If your test is Form C, take Quiz item *Final Form C*.
- If your test is Form D, take Quiz item *Final Form D*.

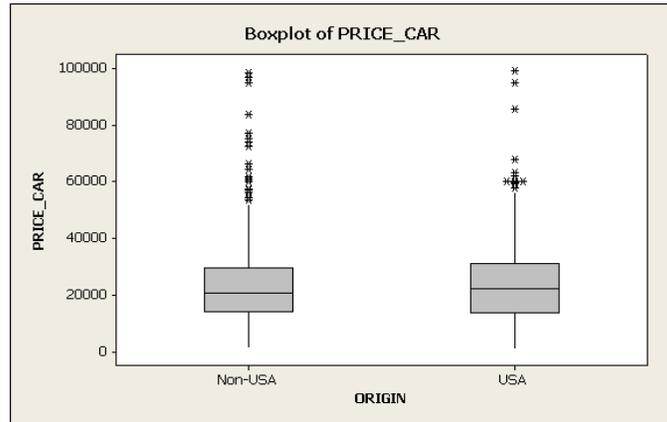
CONFIDENCE LEVEL	90%	95%	99%
z^*	1.645	1.96	2.576

Use the following for the next 2 questions. The spring 2013 MATH1530 class survey asked students to pick a car they wanted to buy in the Johnson City area and answer the question “Which of the following best describes the type of the car?” The options are 4-Door Sedan, 2-Door Coupe, Sports Car, Sport Utility Vehicle (SUV), Pickup Truck, and Mini Van. The variable “TYPE_CAR” groups the original responses into three categories: Sedan Coupe (4-Door Sedan, 2-Door Coupe), Sports Car, and Light Truck (SUV, Pickup Truck, Mini Van). The graph below illustrates the distribution of students’ choice.



1. Approximately what percent of the males selected a light truck?
(A) About 45% (C) About 16%
(B) About 39% (D) About 26%
(E) Unable to determine from the graph. Need a two-way table for more information.
2. 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 there might be some outliers.
(C) It appears that a larger percent of females picked a 4-Door Sedan or a 2-Door Coupe.
(D) Overall, it appears that the distributions of the choice are similar between male and female students.
(E) Side-by-side boxplots would be a better display to compare the choices of the females and the males.

Use the following for the next 3 questions. The Spring 2013 MATH1530 research assignment asked students to pick a car they would buy in the Johnson City area. The boxplot and descriptive statistics below summarize the student responses by gender to the question “What is the sale price (in dollars) of this car?”



Variable	Origin	N	N*	Mean	SE Mean	StDev	Min	Q1	Median	Q3	Maximum
PRICE_CAR	USA	289	23	23,759	921	15,665	900	13,450	22,000	31,090	99,000
	Non-USA	309	22	23,986	927	16,299	1300	13,948	20,400	28,265	70,351

3. Based on above information, which of the following descriptions is false?
- (A) There is more diversity in the sale price among the cars of USA-origin than among the cars of non-USA origin.
 - (B) The origin of the most expensive car in the survey was of USA-origin.
 - (C) The data are skewed right with several outliers for non-USA origin.
 - (D) The data are strongly skewed left with several outliers for USA origin.
 - (E) The interquartile range of the price is larger for USA-origin.
4. About what percent of the cars of USA-origin picked by the students is priced at least \$31,090?
- (A) 75%
 - (B) 50%
 - (C) 25%
 - (D) $z = \frac{31,090 - 23,759}{15,665} = 0.47$ (Area under Normal Curve = 68%)
 - (E) $\frac{31,090 - 900}{99,000 - 900} = 31\%$
5. Which of the following numerical measures should be used to describe the distribution of the sale price of the cars with USA origin in Johnson City area?
- (A) $\bar{x} = 23,759, s = 15,665.$
 - (B) Median = 22,000, $s = 15,665.$
 - (C) Min=900, $Q_1 = 13,450,$ Median = 22,000, $Q_3 = 31,090,$ Max=99,000.
 - (D) Min=900, $Q_1 = 13,450, \bar{x} = 23,759, Q_3 = 31,090,$ Max=99,000.
 - (E) Median = 22,000, $\bar{x} = 15,665.$
6. The spring 2013 MATH1530 class survey asked students to select the category that best describes their favorite genre of film. The table below represents the student responses. Which type of graph is appropriate for these data?

FILM	Action	Children	Comedy	Drama	Horror	Romance	Sci-Fi	Other
Count	115	12	317	38	85	63	60	31

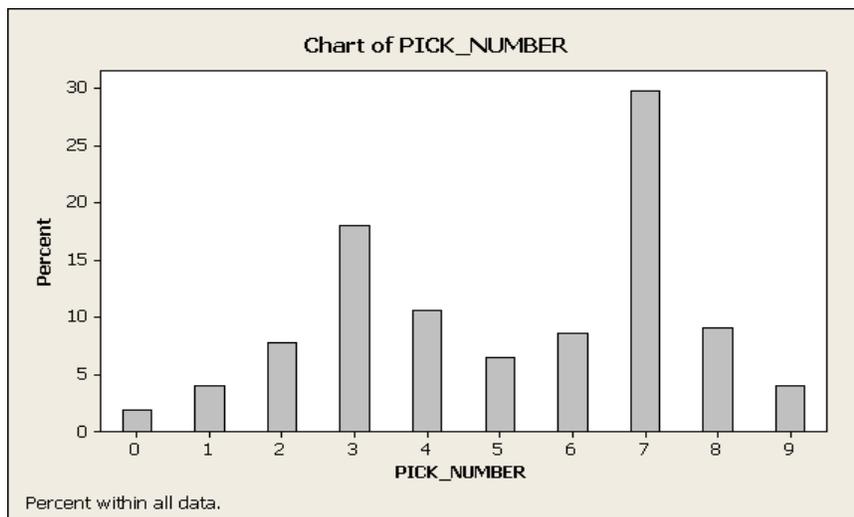
- (A) Bar chart
- (B) Histogram
- (C) Stem plot
- (D) Scatterplot
- (E) Boxplot

7. Which of these questions from the spring 2013 MATH1530 class survey produced variables that are categorical?
- Of the following, circle the category that best describes your favorite genre of film. (Action, Children, Comedy, Drama, Horror, Romance, SciFi, Other)
 - How many people live in your household (including yourself)?
 - What is the sale price (in dollars) of this car?
 - Where is the origin (the world headquarters of the car manufacturer) of this car? (USA, Non-USA, Do not know)
 - What is the city MPG (miles per US gallon) of this car?
- (A) i, iv, v (B) ii, iii. (C) ii, iii, v (D) i, ii, iv (E) i, iv

Use the following for the next 2 questions. The following data (sorted) are sales of the Palm M515 PDA auctioned on eBay. The prices (in dollars) at which the items sold are

178 199 200 210 210 225 225 225 225 228 232 235
240 240 240 245 246 246 246 249 250 250 250

8. Which of the following best describes the distribution of sales of the Palm M515 PDA?
- The observation 255 is an outlier.
 - The distribution is roughly symmetric
 - The distribution is strongly skewed right, bimodal with a possible outlier.
 - The distribution is strongly skewed left, bimodal with a possible outlier.
 - It is impossible to describe the distribution without a histogram.
9. What is the median of these sales of the Palm M515 PDA auctioned on eBay?
- (A) 240 (B) 225 (C) 235 (D) 237.5 (E) 246
10. The spring 2013 MATH1530 class survey asked students to randomly pick a number between 0 and 9. The figure below illustrates 709 responses of students from this survey question. Are we good randomizers?

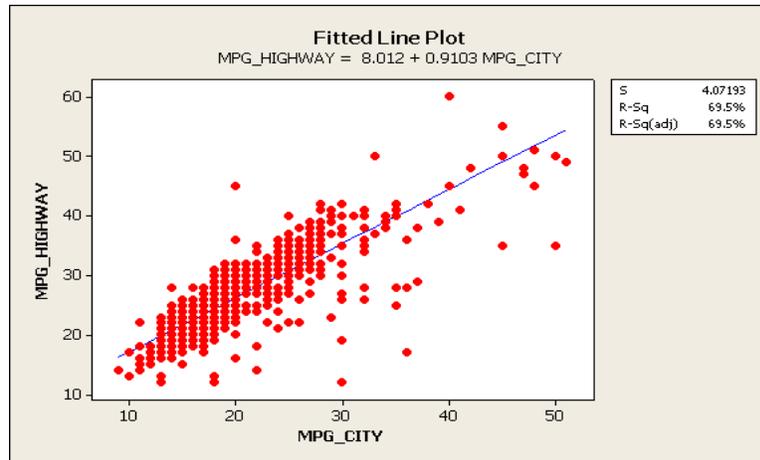


- The distribution is somewhat symmetric about the number 5.
- The distribution is skewed right with a center of about 5.
- It appears that we are good randomizers since all numbers were chosen.
- The distribution should be more bell-shaped with a center of 5 and standard deviation of 2 to satisfy the 68-95-99.7 percent rule.
- It doesn't appear that we are good randomizers. If we were good randomizers we should see a more uniform (flat) distribution across the 10 numbers. We see that the number 7 is picked the most!

11. Scores on the SAT verbal test in recent years follow approximately the Normal distribution with mean $\mu = 504$ and standard deviation $\sigma = 111$. About what percent of these students scored between 282 and 726?
- (A) 68%. (B) 86%. (C) 90%. (D) 95%. (E) 99.7%.

Use the following for the next 3 questions. The spring 2013 MATH1530 class survey asked students to pick a car for sale in the Johnson City area and collect the information of the car they picked. We are interested in the relationship between city MPG (miles per US gallon) and highway MPG of these cars. The scatterplot below shows the observations and the least-squares regression line. The correlation between the two variables is $r = 0.834$ and the least-squares regression line for predicting the *HIGHWAY MPG* of a car from *CITY MPG* is

$$\text{HIGHWAY_MPG} = 8.012 + 0.9103 \times \text{CITY_MPG}.$$



12. Which of the following best describes the relationship between *HIGHWAY MPG* and *CITY MPG*?
- (A) There seems to be a strong negative linear relationship between the two variables 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 *CITY MPG* of the cars is 21.5 and the average *HIGHWAY MPG* is 27.6.
 (E) Since $r = 0.834$, we know that the *CITY MPG* and *HIGHWAY MPG* are almost the same for most of the cars.
13. Which of the following is the correct interpretation of the slope of the least-squares regression line?
- (A) Since the correlation is 0.834, *HIGHWAY MPG* increases by about 83.4% on the average.
 (B) The *HIGHWAY MPG* is about 8 more than *CITY MPG* score on the average.
 (C) As *CITY MPG* increases by 1, *HIGHWAY MPG* will increase by about 8 on the average.
 (D) As *CITY MPG* increases by 1, *HIGHWAY MPG* will increase by about 0.9103 on the average.
 (E) As *HIGHWAY MPG* increases by 1, *CITY MPG* will increase by about 0.9103 on the average.
14. Use the least-squares regression line to predict *HIGHWAY MPG* if a car has a *CITY MPG* of 25.
- (A) $(0.9103)(25) = 22.76$ (C) $8.012 + (0.9103)(25) = 30.77$
 (B) $(0.834)^2(25) = 17.39$ (D) Any value between 10 and 60.
 (E) Any value between 20 and 40.

Use the following for the next 2 questions. A study published in the *New England Journal of Medicine* (Aug. 2001) suggested that it's dangerous to enter a hospital in Ontario, Canada on a weekend. Researchers tracked over 4 million emergency admissions to hospitals over a 10-year period and found that patients admitted on weekends had a much higher risk of death than those who went to the emergency room on weekdays.

15. What kind of study was this?
- (A) an experiment (C) a matched-pair design
(B) a sample survey (D) a stratified sampling
(E) an observational study
16. The researchers said the difference in death rates was “statistically significant.” What does this mean?
- (A) The difference in death rates is higher than they would expect from sampling variability.
(B) The difference in death rates was important.
(C) The null hypothesis is true.
(D) The P -value of the test must have been large.
(E) Stay away from the emergency room on the weekends since it is causing deaths.
17. Twelve golfers are asked to play a round of golf on each of two consecutive weeks. During one round, the golfers use one brand of clubs and during the second, another brand. Which brand they use in which round is determined at random. All scores are recorded, and each golfer is asked to try to play his or her best in each round. This study is
- (A) an observational study. (C) a completely randomized experiment.
(B) a stratified random sample. (D) a double blind experiment.
(E) a matched pairs experiment.
18. A Tennessee state senator wants to know what the voters of Tennessee think of proposed legislation regarding an increase in state sales tax. He mails a questionnaire to a simple random sample of 3000 voters in Tennessee. His staff reports that 789 questionnaires have been returned, of which 678 are against the legislation. This is an example of
- (A) a survey with little bias because a large SRS was used.
(B) a survey with bias because of voluntary responses and large nonresponse rate.
(C) a survey with little bias because it was the voters that elected the senator.
(D) a survey that is representative of the voters thinking.
(E) All of the above.
19. It is reported in the *Information Please Almanac*, (1991, p. 809) the divorce rates in the United States for various years from 1960 to 1986. For these same years the *World Almanac and Book of Facts*, reports the percentage of those admitted to state prisons because of drug offenses. A strong positive correlation ($r = 0.67$) was found between the divorce rate and the percentage of criminals admitted for drug offenses. Based on this correlation, advocates of traditional family values argue that increased divorce rates have resulted in more drug offenses. However, a closer look at this data also found both variables to have a strong positive correlation with time. Is the conclusion from advocates of traditional family values sensible?
- (A) Yes, as the divorce rate goes up this is causing people to use drugs to cope with their failed relationship.
(B) Yes, as the number of drug offenses goes up this is causing the divorce rate to increase.
(C) No, since the correlation r is positive we know that as one variable increases the other one goes down.
(D) Not necessarily. Time could be a lurking variable.
(E) No, it is incorrect to compute r here since one variable is a rate and the other variable is a percentage. If both variables were recorded as percentages than we would get a different r .

20. A study in California showed that students who study a musical instrument have higher GPAs than students who do not, 3.59 to 2.91. Of the music students, 16% had all As, compared with only 5% among the students who did not study a musical instrument. What conclusion can be drawn from this study?
- (A) Since this is a study the researchers can conclude studying music will improve grades.
 - (B) A two-sample t-test should be used to analyze and prove that studying music causes grades to improve.
 - (C) This is an experiment with one factor and two levels: music lessons and without music lessons.
 - (D) The correlation between studying music and grades must be close to 1. This is statistically significant.
 - (E) Since this is an observational study and there was no random assignment, the researchers should not make claims that studying music improved the students' grades. Nor can it prove that students with good grades are more likely to choose to study music.
21. Jack Pot had failed to win a lottery in seven consecutive weeks then purchased a winning lottery ticket. When talking to family members afterward, he says he was very confident of winning that last time playing because he knew he was "due for a win." What do you think?
- (A) Jack Pot has correctly interpreted the law of large numbers by concluding his chances of winning will increase as time goes on.
 - (B) Jack Pot is referring to the law of large numbers, which is false for independent events. His chance of winning the lottery do not change based on recent successes or failures.
 - (C) Jack Pot was overdue for a win and he will not win again for a long time because of the law of averages.
 - (D) Actually, if the probability of winning was $1/1000$ and Jack had lost 999 consecutive weeks then by the law of large numbers he would be due to win.
 - (E) Since the lottery consists of independent events the probability of a winning ticket will be higher in the weeks to come.

Use the following for the next 2 questions. One hundred volunteers who suffer from severe depression are available for a study. Fifty are selected at random and are given a new drug that is thought to be particularly effective in treating severe depression. The other fifty are given an existing drug for treating severe depression. A psychiatrist evaluates the symptoms of all volunteers after four weeks in order to determine if there has been substantial improvement in the severity of the depression.

22. The factor in this study is
- (A) the use of randomization and the fact that this was a comparative study.
 - (B) the drug.
 - (C) the extent to which the depression was reduced.
 - (D) the use of a psychiatrist to evaluate the severity of depression.
 - (E) the one hundred volunteers who suffer from severe depression.
23. This study would be double blind if
- (A) the final results are "statistically significant."
 - (B) the volunteers did not know whether they received the new drug or the existing drug.
 - (C) neither the volunteers nor the psychiatrist knew which treatment each person had received.
 - (D) neither drug had any identifying marks on it.
 - (E) all volunteers were not allowed to see the psychiatrist nor the psychiatrist allowed to see the volunteers during the session during which the psychiatrist evaluated the severity of the depression.

Use the following for the next 4 questions. The Spring 2013 MATH1530 class survey asked students their opinion on the proposal to reduce gun violence. The question was “After recent tragic mass shootings in Newtown, Aurora, Oak Creek, and Tucson, President Obama proposed a set of new laws designed to reduce gun violence in the United State on January 16. From what you know or have known, would you want your representative in congress to vote for or against these proposed new laws?” Three options were given: Against, For, Don’t know. The distribution of counts is shown below in the table. Choose a student at random from this group.

Tabulated statistics: Gender, OPINION_GUN

Rows: Gender Columns: OPINION_GUN

	For	Against	Don’t know	All
Female	109	203	101	413
Male	69	185	39	293
All	178	388	140	706

Cell Contents: Count

24. The probability that the student was a female and would support president Obama’s proposal is
 (A) $109/413$ or .2639 (B) $109/178$ or .6124 (C) $413/706$ or .585 (D) $178/706$ or .2521 (E) $109/706$ or .1544
25. The conditional probability that the student was a female, given that the student would support president Obama’s proposal is
 (A) $109/413$ or .2639 (B) $109/706$ or .1544 (C) $109/178$ or .6124 (D) $413/706$ or .585 (E) $178/706$ or .2521
26. The conditional probability that the student would support president Obama’s proposal, given that the student was a female, is
 (A) $109/413$ or .2639 (B) $109/706$ or .1544 (C) $109/178$ or .6124 (D) $413/706$ or .585 (E) $178/706$ or .2521
27. A Chi-square test was performed for the above two-way table and the Minitab output shows the related information.

Pearson Chi-Square = 17.387, DF = 2, P-Value = 0.000

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

- (A) Since the P -value is 0 the probability that male and female opinions on gun control legislation are equal.
- (B) Since the P -value is small we conclude that gender and gun control legislation are independent.
- (C) There is no relationship between gender and the opinion of MATH1530 students on president Obama’s proposal. More students would object regardless of their gender.
- (D) There is a relationship between gender and the opinion of MATH1530 students on president Obama’s proposal. The proportion of male students who would object to the proposal is much larger than that of female students.
- (E) There is a relationship between gender and the opinion of the students on president Obama’s proposal because there are more females than males in the dataset.
28. Consider the following example from research on statistical reasoning (Nisbett, et al., 1987 in *Science*). There are two hospitals: in the first one, 120 babies are born every day, in the other, only 12. On average, the ratio of baby boys to baby girls born every day in each hospital is 50/50. However, one day, in one of those hospitals twice as many baby girls were born as baby boys. In which hospital was it more likely to happen? Explain.
- (A) Equally likely $80/120$ is equal to $8/12$.
- (B) It is equally likely to be 20 babies far from 60 than 2 babies far from 6.
- (C) It is much more likely to happen in the small hospital. The reason for this is that technically speaking, the probability of a random deviation of a particular size (from the population mean), decreases with the increase in the sample size.
- (D) It is much more likely to happen in the larger hospital since the number of births is larger. This is called the law of large numbers.
- (E) In the larger hospital $80/120$ is greater than $8/12$.

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

Use the following for the next 3 questions. A random sample of 25 tires of a certain brand was taken and the lifetime of these tires was measured. The sample mean is $\bar{x} = 50$ months. Suppose that the lifetimes for tires of this brand follow a normal distribution, with unknown mean μ and standard deviation $\sigma = 5$ months.

30. A 95% confidence interval for μ , in months, is
(A) 50 ± 1.96 . (B) 50 ± 9.8 . (C) 50 ± 0.392 . (D) 50 ± 1 . (E) 50 ± 25 .
31. Which of the following is the best interpretation of the above calculated confidence interval?
(A) With 95% confidence, the true mean lifetime of the tires of this brand is within the calculated interval.
(B) There is a 95% probability that the true lifetime of the tires of this brand is within the calculated confidence interval.
(C) The mean lifetime of the tires of this brand is within the 95% confidence interval.
(D) 95% of all tires of this brand had the average lifetime within the calculated confidence interval.
(E) With 95% confidence, all the sample means will be within the calculated confidence interval.
32. Suppose a random sample of 100 tires rather than 25 was measured. Which of the following statements is true?
(A) The margin of error for our 95% confidence interval would decrease.
(B) The margin of error for our 95% confidence interval would increase.
(C) The margin of error for our 95% confidence interval would stay the same, since the level of confidence has not changed.
(D) The standard deviation σ would decrease.
(E) The margin of error for our 95% confidence interval could decrease or increase depending on the value of the sample mean of the 100 tires.

Use the following for the next 2 questions. The 2012 USA census shows that the average number of people per household is 2.55. The Spring 2013 MATH1530 class survey asked “How many people live in your household (including yourself)?” Assume that the students who responded to the survey is an SRS of all ETSU students. We want to know if the average number of people per household of current ETSU students is greater than the national average. The hypotheses for a test to answer this question are

$$H_0 : \mu = 2.55 \quad \text{vs} \quad H_a : \mu > 2.55.$$

33. Which of the following procedures would you choose to test the hypotheses?
(A) One-sample proportion. (B) One-sample t. (C) Two-sample t. (D) Paired t. (E) One-sample z.
34. Which is a correct description of the Type I error in this case?
(A) If the P-value is less than α then reject H_0 .
(B) The Type I error cannot be described correctly without the results of the hypothesis testing.
(C) We conclude that the average number of people per household of current ETSU students is 2.55 but actually it is greater than 2.55.
(D) We conclude that the average number of people per household of current ETSU students is not 2.55 but actually it is 2.55.
(E) We conclude that the average number of people per household of current ETSU students is greater than 2.55 but actually it is 2.55.
35. Studies have shown that walnuts can reduce blood cholesterol. Rich in polyunsaturated fatty acids, walnuts also help keep blood vessels healthy and elastic. Almonds appear to have a similar effect, resulting in a marked improvement within just four weeks. A statistical test is more likely to find a not significant decrease in blood cholesterol if
(A) the size of the sample does not have any effect on the significance of the test. (C) it is based on a very small random sample.
(B) it is based on a very large random sample. (D) the test of hypotheses is rejected.
(E) the p-value is small.

Use the following for the next 5 questions. Time Magazine wants to know the opinion of adult Americans to the question “If you or your spouse were pregnant, would you want the unborn child tested for genetic defects?” Specifically, they wanted to know what proportion of all adult Americans who would say yes to this question. They conducted a survey and selected a simple random sample of 1600 adult Americans. In the sample, 928 people answered “yes.”

36. What is the population of interest in this survey?
- (A) The people who conducted the survey.
 - (B) The proportion of adults that answered “yes” in the survey.
 - (C) The 1600 adults interviewed.
 - (D) The 928 adults who answered yes to the question.
 - (E) All adult Americans.
37. What is the parameter to be estimated?
- (A) The proportion of adult Americans who would want their unborn child tested for genetic defects.
 - (B) All adult Americans
 - (C) 1600
 - (D) 0.58
 - (E) 928
38. Based on the sample collected, what is the estimated value of the parameter?
- (A) The proportion of adult Americans who would want their unborn child tested for genetic defects.
 - (B) Unknown, we need to take a census.
 - (C) 1600
 - (D) 0.58
 - (E) 928
39. Do the results show enough significance that the proportion of adult Americans who would want their unborn child tested for genetic defects is less than 60%? The hypotheses for a test to answer this question are
- (A) $H_0 : p = 0.6, H_a : p > 0.6$ (C) $H_0 : \hat{p} = 0.58, H_a : \hat{p} > 0.58$
 - (B) $H_0 : p = 0.6, H_a : p < 0.6$ (D) $H_0 : \hat{p} = 0.58, H_a : \hat{p} < 0.58$
 - (E) $H_0 : \mu = 0.6, H_a : \mu \neq 0.6$
40. A one sample proportion test was performed and the P-value is 0.051. What conclusion can we make based on this evidence? Use $\alpha = 0.01$. Comment on any assumptions that are needed for your conclusions to be accurate.
- (A) There is not enough evidence to suggest that the proportion of adult Americans who would want their unborn child tested for genetic defects is less than 60%. It is assumed that the people who responded to the survey represent all adult Americans.
 - (B) There is enough evidence to suggest that the proportion of adult Americans who would want their unborn child tested for genetic defects is less than 60%. However, we cannot trust the results because the sample size is not large enough compared to American adult population.
 - (C) Reject H_0 and conclude that the proportion of adult Americans who would want their unborn child tested for genetic defects is less than 60%. It is important that the data follow the Normal distribution and there are no outliers.
 - (D) Do not reject H_0 since the P-value is larger than α . It is important that the data follow the Normal distribution and there are no outliers.
 - (E) Since the sample size is large ($n = 1600$), there is no need to worry about the assumptions and any small deviation of a sample proportion from 60% would be statistically significant outcome.

41. A researcher wishes to determine if aerobic exercise improves mental performance immediately following the exercise. He plans to have high school students participate in 30 minutes of aerobic exercise and then take a standard test of their reasoning skills. Suppose that in the general population of all high school students, scores on the test of reasoning skills follow a normal distribution with mean 25 and standard deviation $\sigma = 4$. The researcher, therefore, decides to test the hypotheses

$$H_0 : \mu = 25 \quad \text{vs} \quad H_a : \mu > 25.$$

To do so, the researcher has 10,000 high school students do 30 minutes of aerobic exercise and then, immediately following the exercise, take the test. The mean score for these students is $\bar{x} = 25.2$ and the P-value is less than 0.0001. Which of the following is the most appropriate conclusion?

- (A) The researcher cannot draw any conclusion. The current \bar{x} value is close to 25.2 just by chance. If he take a second sample of the same sample size, the P-value could be very large.
- (B) There difference of 0.2 is not significance in practice. The researcher needs to take a larger sample to determine whether for high school students, 30 minutes of aerobic exercise substantially improves mental performance.
- (C) The P-value is close to 0 simply because the researcher took such a large sample. So while we may have evidence that for high school students, 30 minutes of aerobic exercise improves mental performance, there is no evidence that it is significant in practice.
- (D) The P-value is close to 0. There is enough evidence that for high school students, 30 minutes of aerobic exercise substantially improves mental performance and this difference is also significant in practice.
- (E) Based on the law of large number, the researcher could claim that he has strong evidence that for high school students, 30 minutes of aerobic exercise substantially improves mental performance.

Use the following for the next 2 questions. The spring 2013 MATH1530 survey asked students to pick a car they wanted to buy and find the price (in dollars) and the origin of the car. Based on the data, we want to know whether there is good evidence that the average price for all USA cars for sale in the Johnson City area is less than that of all Non-USA cars. The statistics are

ORIGIN	N	Mean	StDev	SE Mean
Non-USA	309	23,986	16,299	927
USA	289	23,759	15,665	921

42. To perform the hypothesis testing, what analysis should we conduct?
- (A) Two sample t test. (B) One sample t test. (C) One sample z test. (D) A Chi-square test. (E) A regression model.
43. The appropriate analysis was performed. The results show a P-value of 0.431 and a test statistic of 0.17. Which of the following options answers the research question? Use $\alpha = 0.05$.
- (A) There is a mistake in the analysis. The difference in the means of the two groups is $23,986 - 23,759 = \$227$ so the P-value should be very small.
 - (B) The P-value is so large that we will reject the null hypothesis. There is strong evidence that the average price for all USA cars for sale in the Johnson City area is less than that of all Non-USA cars.
 - (C) The P-value is so large that we will reject the null hypothesis. There is strong evidence that the average price for all USA cars for sale in the Johnson City area is different from that of all Non-USA cars.
 - (D) The P-value is so large that we will not reject the null hypothesis. There is not strong evidence that the average price for all USA cars for sale in the Johnson City area is less than that of all Non-USA cars.
 - (E) Reject H_0 since the mean and standard deviation for USA cars are less than the mean and standard deviation for Non-USA cars.