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19. A STAT 200 instructor believes that the average quiz score is a good predictor of final exam score. A random sample of 10 students produced the following data where x is the average quiz score and y is the final exam score.

x	80	95	50	60	100	40	85	70	75	85
y	70	96	50	63	96	38	83	60	77	87

- (a) Find an equation of the least squares regression line. *Show all work; writing the correct equation, without supporting work, will receive no credit.*
- (b) Based on the equation from part (a), what is the predicted final exam score if the average quiz score is 65? *Show all work and justify your answer.*
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18. The UMUC Daily News reported that the color distribution for plain M&M's was: 40% brown, 20% yellow, 20% orange, 10% green, and 10% tan. Each piece of candy in a random sample of 100 plain M&M's was classified according to color, and the results are listed below. Use a 0.05 significance level to test the claim that the published color distribution is correct. *Show all work and justify your answer.*

Color	Brown	Yellow	Orange	Green	Tan
Number	42	18	15	7	18

- (a) Identify the null hypothesis and the alternative hypothesis.
- (b) Determine the test statistic. *Show all work; writing the correct test statistic, without supporting work, will receive no credit.*
- (c) Determine the P-value. *Show all work; writing the correct P-value, without supporting work, will receive no credit.*
- (d) Is there sufficient evidence to support the claim that the published color distribution is correct? Justify your answer.

15. A researcher claims the proportion of auto accidents that involve teenage drivers is less than 20%. ABC Insurance Company checks police records on 200 randomly selected auto accidents and notes that teenagers were at the wheel in 32 of them.

Assume the company wants to use a 0.05 significance level to test the researcher's claim.

- (a) Identify the null hypothesis and the alternative hypothesis.
- (b) Determine the test statistic. *Show all work; writing the correct test statistic, without supporting work, will receive no credit.*
- (c) Determine the P -value for this test. *Show all work; writing the correct P -value, without supporting work, will receive no credit.*
- (d) Is there sufficient evidence to support the researcher's claim that the proportion of auto accidents that involve teenage drivers is less than 20%? Explain.

16. Mimi was curious if regular exercise really helps weight loss, hence she decided to perform a hypothesis test. A random sample of 5 UMUC students was chosen. The students took a 30-minute exercise every day for 6 months. The weight was recorded for each individual before and after the exercise regimen. Does the data below suggest that the regular exercise helps weight loss? Assume Mimi wants to use a 0.05 significance level to test the claim.

Subject	Weight (pounds)	
	Before	After
1	190	180
2	170	160
3	185	175
4	160	160
5	200	190

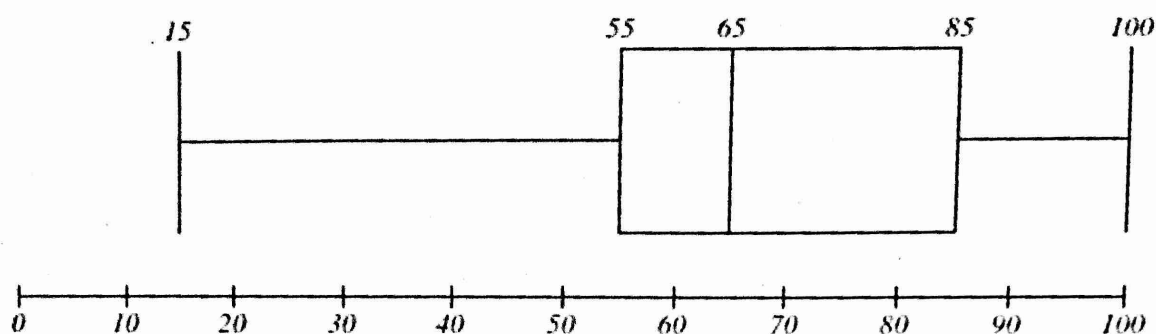
- (a) Identify the null hypothesis and the alternative hypothesis.
- (b) Determine the test statistic. *Show all work; writing the correct test statistic, without supporting work, will receive no credit.*
- (c) Determine the p-value. *Show all work; writing the correct critical value, without supporting work, will receive no credit.*
- (d) Is there sufficient evidence to support the claim that regular exercise helps weight loss? Justify your conclusion.

3. The frequency distribution below shows the distribution for IQ scores for a random sample of 1000 adults. (Show all work. Just the answer, without supporting work, will receive no credit.)

IQ Scores	Frequency	Cumulative Relative Frequency
50 - 69	25	
70 - 89	250	
90 - 109		0.725
110 - 129		
130 - 149	27	
Total	1000	

- (a) Complete the frequency table with frequency and cumulative relative frequency. Express the cumulative relative frequency to three decimal places.
- (b) What percentage of the adults in this sample has an IQ score between 90 and 129, inclusive?
- (c) Which of the following IQ score groups does the median of this distribution belong to? 70 - 89, 90 - 109, or 110 - 129? Why?

4. The five-number summary below shows the grade distribution of a STAT 200 quiz for a sample of 200 students.



Answer each question based on the given information and *explain* your answer in *each* case.

- (a) What is the range in the grade distribution?
- (b) Which of the following score bands has the most students?
 - (i) 25 - 45
 - (ii) 35 - 55
 - (iii) 45 - 65
 - (iv) Cannot be determined
- (c) About how many students in the sample are in the score band between 65 and 85?
 - (i) 20
 - (ii) 30
 - (iii) 50
 - (iv) 100