Practice questions for the Midterm. Part B.

1. Mars Candy Company claims that of all its peanut M&M's, 20% are yellow, 20% are red, 30% are brown, and there are 10% each of orange, blue, and green. Based on a randomly selected Peanut M&M packet with 80 pieces, to check veracity of Mars Candy Company's claim about the distribution of M&M colors, we have to use the:

chi sq goodness-of-fest test
df = no. of categories - 1 = 6 -1 = 5

A) t distribution with 79 df.
B) Chi-square distribution with 2 df.
C) Chi-square distribution with 4 df.
D) Chi-square distribution with 5 df.
E) Chi-square distribution with 6 df.

2. The table below cross-classifies 2,201 people aboard the Titanic based on whether they survived the sinking and on whether they were crew members or passengers booked in first-, second-, or third-class staterooms. To test the hypothesis that the chances of surviving were independent of the status on the ship, we first need to calculate the expected counts under the null hypothesis. What is the expected count for the members of the crew that would not survive the sinking?

	Crew	*First*	*Second*	*Third*
Alive	212	202	118	178
Dead	673	123	167	528

A) 599.52
B) 885
C) 212
D) 673
E) 285.48

(1491*885)/2201

3. You have computed the following 95% confidence interval for a population mean μ: [2.5 , 3.5]. For the test of H_0: $\mu = 3.41$ vs. H_A: $\mu \neq 3.41$, which of the following will be your decision at the 1% level?

A) Reject the null hypothesis.
B) Do not reject the null hypothesis.
C) More information is needed to make the decision.

4. Which of the following is true?

A) Confidence intervals are wider for 88% confidence level than for 83% confidence level.
B) All chi-square distributions have the mean of zero.
C) All t distributions are skewed to the right.
D) All of the above
E) None of the above

5. Which of the following is true?

A) If IQR=0, all the values in the sample are exactly the same.
B) The mean of every normal distribution is zero.
C) Standard deviation is robust.
D) Standard deviation is a measure of the center of the distribution.
E) None of the above.

NOT TRUE - IQR only takes into account the middle 50% of the data. The 25% at each end could still be different

Robust = stable, insensitive to outliers. SD is not robust.

6. Stanford-Binet IQ Test scores are normally distributed with a mean score of 100 and a standard deviation of 16. Find the value x for which:
Probability that *(a randomly selected person has an IQ test score less than x)* is approximately 84%.

A) 68
B) 84
C) 100
D) 116
E) 132

P(X<x) = 84%

To unstandardize:
x = mean + z(SD)

7. Consider the previous question. What is the probability that the average score of 4 randomly selected individuals is greater than 116?

A) About 2.5%
B) About 5%
C) About 16%
D) About 68%
E) About 84%

xbar is normal
E(xbar) = mean = 16
SD(xbar) = 16/sqrt4 = 8
P(xbar>116)

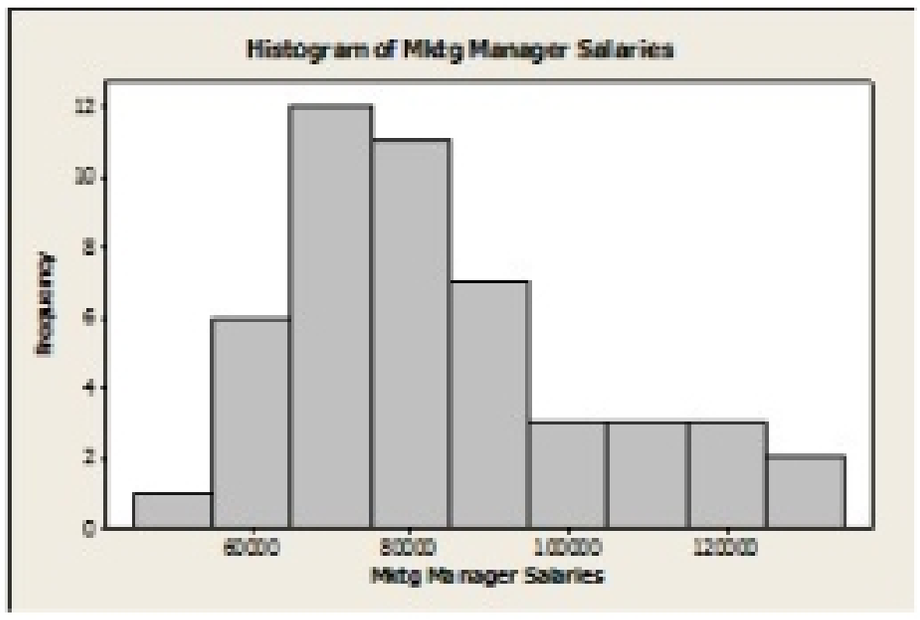
8. You are doing a two-sided hypothesis test for the population proportion using a sample of 50, and you get a test statistic of 2.0. This means:
(Use the following z or t values: $z_{0.1}$=1.282, $z_{0.05}$=1.645, $z_{0.025}$=1.96; $t_{0.1}$=1.299, $t_{0.05}$=1.677, $t_{0.025}$=2.01)

A) you cannot reject the null hypothesis at the 10% significance level;
B) you can reject the null hypothesis at the 10% significance level, but not at the 5% level;
C) you can reject the null hypothesis at the 5% significance level.

9. Consider a normal density curve centered at $x = 2$. The area under the curve between $x = 2$ and $x = 3$ is _____ the area under the same density curve between $x = 0$ and $x = 1$.

A) Less than
B) Greater than
C) Equal to
D) Twice as large as
E) More information is needed to answer this question

Consider the following information for problems **10 – 12**.
Below is a histogram and the five number summary of salaries (in $) for a sample of U.S. marketing managers.



Min	Q1	Median	Q3	Max
46360	69693	77020	91750	129420

10. The shape of this distribution is

A) symmetric.
B) bimodal.
C) right skewed.
D) left skewed.
E) normal.

11. The IQR for these data is

A) $83,060.
B) $22.057.
C) $69,693
D) $77.020
E) $14,566

12. Suppose the marketing manager who was earning $129,420 got a raise and is now earning $140,000.
Which of the following statements is true about the changes in the data?

A) The mean would increase.
B) The IQR would increase.
C) All of the above.
D) Both the mean and the IQR would stay the same

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13. Which of the following is true about *t*-distributions?

A) they have mean zero
B) as the degrees of freedom increase, they approach the standard normal distribution
C) they have more probability in the tails than the standard normal distribution
D) All of the above
E) None of the above