MATH-1XXX (DUPRÉ) FALL 2013 TEST 3 ANSWERS

DATE: WEDNESDAY 6 NOVEMBER 2013

FIRST: PRINT YOUR LAST NAME IN LARGE CAPITAL LETTERS ON THE UPPER RIGHT CORNER OF EACH SHEET TURNED IN.

SECOND: PRINT YOUR FIRST NAME IN CAPITAL LETTERS DIRECTLY UNDERNEATH YOUR LAST NAME ON EACH SHEET TURNED IN.

THIRD: WRITE YOUR MATH COURSE NUMBER AND SECTION NUMBER DIRECTLY UNDERNEATH YOUR FIRST NAME ON EACH SHEET TURNED IN.

Use the attached TABLE for critical values of the t-distribution.

Suppose that the time X in minutes for a trolley to arrive is uniformly distributed with minimum value 10 and maximum value 50. Calculate:

1. $E(X) =$

A. 20

B. 25

C. 30

D. 35

E. NONE OF THE ABOVE

CORRECT ANSWER: C

2. $P(X \leq 25) =$

A. 3/8

B. 4/8

C. 5/8

D. 6/8

E. NONE OF THE ABOVE

CORRECT ANSWER: A

3. $P(X > 25) =$

A. 3/8

B. 4/8

C. 5/8

D. 6/8

E. NONE OF THE ABOVE

CORRECT ANSWER: C

We randomly draw 10 cards from a standard deck of cards and count the number T of times we get a spade. Calculate:

4. $E(T) =$

A. 2

B. 2.5

C. 3

D. 3.5

E. NONE OF THE ABOVE

CORRECT ANSWER: B

5. To four significant digits, σ_T(given drawing with replacement)=

A. 1.2426

B. 1.3693

C. 1.4349

D. 1.5811

E. NONE OF THE ABOVE

CORRECT ANSWER: B

6. σ_T(given drawing without replacement)=

A. 1.2426

B. 1.3693

C. 1.4349

D. 1.5811

E. NONE OF THE ABOVE

CORRECT ANSWER: A

7. $P(T = 3|\text{drawing with replacement}) =$

A. $C(13, 3) \cdot C(39, 7)/C(52, 10)$

B. $C(13, 3) \cdot (.25)^3 \cdot (.75)^7$

C. $C(10, 3) \cdot C(13, 7)/C(10, 7)$

D. $C(10, 3) \cdot (.25)^3 \cdot (.75)^7$

E. NONE OF THE ABOVE

CORRECT ANSWER: D

8. $P(T = 3|\text{drawing without replacement}) =$

A. $C(13, 3) \cdot C(39, 7)/C(52, 10)$

B. $C(13, 3) \cdot (.25)^3 \cdot (.75)^7$

C. $C(10, 3) \cdot C(13, 7)/C(10, 7)$

D. $C(10, 3) \cdot (.25)^3 \cdot (.75)^7$

E. NONE OF THE ABOVE

CORRECT ANSWER: A

Suppose that we are studying the population of bears in Smokey Mountain National Park. We have an independent random sample of 9 bears from the population with a sample mean weight of 900 pounds and a sample standard deviation of 75 pounds. We assume that bear weight is normally distributed for bears in the population.

9. What is the MARGIN OF ERROR in the 95 percent confidence interval for the true mean weight of bears in the population if we know that the POPULATION standard deviation for the weight of bears in the population is 60 pounds?

A. $(1.960)(60)/3$

B. $(2.262)(60)/3$

C. $(2.262)(75)/3$

D. $(2.306)(75)/3$

E. NONE OF THE ABOVE

CORRECT ANSWER: A

10. If we know that the POPULATION standard deviation in bear weight is 60 pounds, does our sample data establish that the true mean weight of bears exceeds 850 pounds at the .01 significance level? Give the value of the standardized test statistic for the sample data and give the P-Value of the data.

A. YES, $z = 2.5$, P-Value $= P(Z > 2.5) < .01$

B. NO, $z = 2.5$, P-Value $= P(Z > 2.5) < .01$

C. YES, $t = 2$, P-Value $= P(t > 2 \mid DF = 9) < .01$

D. NO, $t = 2$, P-Value $= P(t > 2 \mid DF = 8) > .01$

E. NONE OF THE ABOVE

CORRECT ANSWER: A

11. What is the MARGIN OF ERROR in the 95 percent confidence interval for the true mean weight of bears in the population if we DO NOT know that the population standard deviation in weight of bears is 60 pounds but instead use our sample standard deviation of 75 pounds?

A. (1.960)(60)/3

B. (2.262)(60)/3

C. (2.262)(75)/3

D. (2.306)(75)/3

E. NONE OF THE ABOVE

CORRECT ANSWER: D

12. If we DO NOT know that the POPULATION standard deviation in weight of bears is 60 pounds, and instead use the sample standard deviation, does our sample establish that the true mean weight of bears exceeds 850 pounds at the .01 significance level? Give the value of the standardized test statistic for the sample data and and give the P-Value of the data.

A. YES, $z = 2.5$, P-Value $= P(Z > 2.5) < .01$

B. NO, $z = 2.5$, P-Value $= P(Z > 2.5) < .01$

C. YES, $t = 2$, P-Value $= P(t > 2 \mid DF = 9) < .01$

D. NO, $t = 2$, P-Value $= P(t > 2 \mid DF = 8) > .01$

E. NONE OF THE ABOVE

CORRECT ANSWER: D