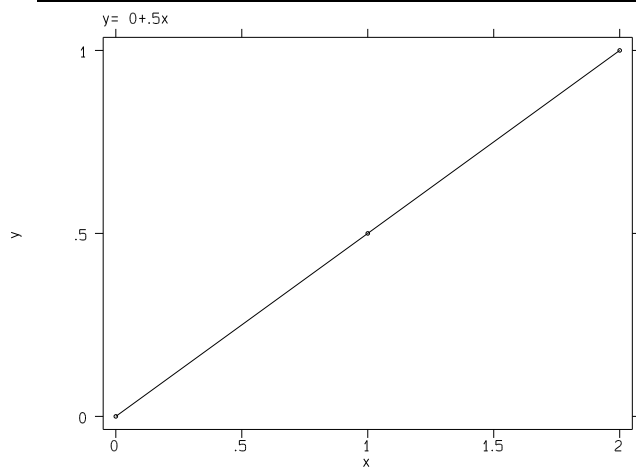


STAT303: Secs 102 and 103
Summer I 2000
Exam #2
Form A

Instructor: Julie Hagen Carroll

1. **Don't EVEN open this until you are told to do so.**
2. Be sure to mark your section number and your test form (A, B, C or D) on the scantron!
3. Sign your name where indicated on your scantron and write your section number, seat number and computer number beside it. You will get your scantrons back tomorrow in class. You may keep this exam.
4. There are 20 multiple-choice questions on this exam, each worth 5 points. There is partial credit. Please mark your answers **clearly** on the scantron. Multiple marks will be counted wrong.
5. You will have 60 minutes to finish this exam.
6. If you are caught cheating or helping someone to cheat on this exam, you both will receive a grade of **zero** on the exam. You must work alone.
7. This exam is worth 100 points, and will constitute 20% of your final grade.
8. Good luck!

- What is the 89th percentile for a standard normal, i.e., $Z \sim N(0, 1)$?
 - 0.89
 - 0.81
 - 1.23
 - 1.28
 - 1.60
- What is z^* such that $P(-z^* < Z < z^*) = 0.80$?
 - 0.7881
 - 0.84
 - 0.90
 - 1.28
 - 1.645



- What is $P(X \geq 0.5)$?
 - 0.9375
 - 0.25
 - 0, there is no probability at exact points
 - 0.875
 - 0.0625

- Probability is
 - the area under the curve
 - the likelihood of an event occurring
 - a proportion
 - all of the above
 - exactly two of the above

Hometown	Vehicle			Total
	car	suv	truck	
lcity	9	1	2	12
metro	20	9	3	32
outsid	2	0	3	5
scity	12	2	2	16
town	13	3	7	23
Total	56	15	17	88

Pearson $\chi^2(8) = 13.1191$ Pr = 0.108

- The table above shows the relationship between what students in the class drive and where they live. Do you think the two categories are related? Remember what the χ^2 , chi-squared tells us!
 - The p-value, Pr = 0.108, is greater than 5%, so we can say that the relationship is statistically significant.
 - The p-value, Pr = 0.108, is greater than 5%, so we can NOT say that the relationship is statistically significant.
 - If you live in a metroplex, then you're most likely to drive a car, so the categories are NOT related.
 - The probability of driving a car is about the same whether you know you live in a metroplex or not, so the categories are not related.
 - Since the table contains only one 0, the categories must be related.
- From the previous table, how likely are you to drive a *truck* if you live in a *town*?
 - 7/88
 - 7/17
 - 7/23
 - 17/23
 - 17/88
- Again from the table, how likely are you to be from a *small city* AND drive a *truck*?
 - 2/88
 - 2/16
 - 2/17
 - 16/17
 - 2/17*2/16
- And still from the table, are driving an *SUV* and living in a *large city* independent events?
 - Yes, there's only one in either category.
 - Yes, it's the least likely choice in either category.
 - No, $1/12 \neq 1/15$.
 - No, $12/88 * 15/88 \neq 1/88$.
 - No, $12/88 \neq 15/88$.

- For $Z \sim N(0, 1)$, what is $P(Z > -1.26)$?
 - 0.8962
 - 0.8962
 - 0.1038
 - 0.1038
 - 0.3962

10. If $X \sim N(1, 2^2)$, what is $P(X > 2.22)$?

- A. 0.9868
- B. 0.0132
- C. 0.6100
- D. 0.28
- E. 0.2709

x		p(X)
1		0.23
2		0.31
4		0.23
5		0.08
6		0.15

11. What are the mean, μ_X , and standard deviation, σ_X , of the distribution above?

- A. $\mu_X = 3.07, \sigma_X = 1.77$
- B. $\mu_X = 1.75, \sigma_X = 1.77$
- C. $\mu_X = 3.07, \sigma_X = 3.125$
- D. $\mu_X = 1.75, \sigma_X = 3.125$
- E. $\mu_X = 4, \sigma_X = 2$

12. Using the information above, what is the population median? Pick the most appropriate answer.

- A. There is not any number with 50% probability, so there is no median of this population.
- B. 4, it's the middle number.
- C. 3.5, it's halfway between 1 and 6.
- D. 2, it's the most common value.
- E. 2, it's the 50th percentile.

13. Still using the information above, what is $P(X = 3)$?

- A. 0, since X can't be 3
- B. 0, since X is continuous
- C. $0.23 + 0.31 = 0.54$
- D. $(0.31 + 0.23)/2 = 0.27$
- E. 0.5, since 3 is in the middle of the distribution

14. Still using the information above, what is $P(X > 5)$?

- A. $P(X > 5) = P(X < -5) = 0$
- B. $P(X > 5) = P(X = 6) = 0.15$
- C. $P(X > 5) = P(X \leq 5) = 0.08$
- D. $P(X > 5) = P(X \leq 5) = 0.08 + 0.23 + 0.31 + 0.23 = 0.85$
- E. $P(X > 5) = P(X = 5) + P(X = 6) = 0.08 + 0.15$

15. What is the 75th percentile of $X \sim N(6, 3^2)$?

- A. 0.675
- B. 8.25
- C. 8.025
- D. 8.32
- E. 6.75

16. Which of the following is true?

- A. The larger the sample size, n , the less variable the sample means, \bar{x} 's.
- B. The sample means will have the same mean as the population, $\mu_{\bar{x}} = \mu_x$, if we take random samples.
- C. Unbiasedness means the sample is random.
- D. All of the above are true.
- E. Exactly two of the above are true.

17. If $dirt \sim N(5, 3^2)$, what is $P(dirt < 2.75)$?

- A. It can't be determined from what is given.
- B. -0.75
- C. 75%
- D. 0.675
- E. 0.2266

18. For $Z \sim N(0, 1)$, what is $P(0.82 < Z < 3.06)$?

- A. 0.205
- B. 0.7928
- C. 0.2061
- D. 0.1585
- E. 0.9875

19. What is x^* such that $P(X < x^*) = 0.33$ if $X \sim N(10, 4^2)$?

- A. 3.33
- B. 8.24
- C. 8.68
- D. 1.32
- E. 4.4

20. For $X \sim N(10, 6^2)$, what is the distribution of \bar{X}_{25} ?

- A. $\mu_{\bar{X}_{25}} = 10$ and $\sigma_{\bar{X}_{25}}^2 = 6^2/5$, but we cannot be sure that the shape is normal since the sample size is less than 30.
- B. $\mu_{\bar{X}_{25}} = 10$ and $\sigma_{\bar{X}_{25}}^2 = 6^2/5^2$, but we cannot be sure that the shape is normal since the sample size is less than 30.
- C. $N(10, (6/5)^2)$
- D. $N(10/5, (6/5)^2)$
- E. $N(10/25, (6/25)^2)$

1C,2D,3A,4D,5B,6C,7A,8D,9A,10E,11A
12E,13A,14B,15C,16E,17E,18A,19B,20C