

MATH 104 - EXAM III MAKE-UP

1. Find the area under the standard normal curve between $z = -2$ and $z=1$.
- a. 0.8185 b. 0.8641 c. 0.1359 d. 0.8413 e. 0.0228
2. Assume that the weight of newborn babies is normally distributed with mean $\mu = 8$ lbs and standard deviation $\sigma = 0.5$ lbs. Find the probability that a randomly selected newborn weighs between 7.75 and 8 lbs.
- a. 0.25 b. 0.5 c. 0.6915 d. 0.1915 e. 0.0987
3. The population of scores, for a class of 20 students, on a 5 question quiz is given by the table below. The mean for the scores is 3. What is the population variance for the scores?

Score	Frequency
0	0
1	2
2	3
3	10
4	3
5	2

- a. 1.1 b. $\sqrt{1.1}$ c. 10.1 d. $\sqrt{10.1}$ e. 0

4. A pair of dice are rolled together 180 times and the number of doubles is recorded. Estimate the probability that the number of doubles is between 25 and 31 inclusive (use the normal approximation).

- a. 0.7536 b. 0.4338 c. 0.4822 d. 0.3557 e. 0.4041

5. A coin is tossed 100 times. Estimate the probability of getting exactly 47 heads (use the normal approximation).

- a. 0.0703 b. 0.0665 c. 0.0624 d. 0.0342 e. 0.0606

6. What is the x-intercept of the line through the point $(-2, 3)$ that is perpendicular to the line $2x + 3y = 1$?

- a. $\frac{5}{2}$ b. 6 c. $\frac{11}{2}$ d. 0 e. -4

7. When John and Mary took their two children to the movies, the cost of these four tickets was \$20. Alex took his three children to the same movie and the cost of these four tickets was \$18. If x is the price of an adult ticket and y is the price of a child's ticket, then the equations describing the situation are:

a. $x + y = 20$
 $x + 3y = 18$

b. $x + y = 20$
 $x + y = 18$

c. $2x + y = 20$
 $2x + 3y = 18$

d. $2x + 2y = 20$
 $x + 3y = 18$

e. $2y = x$

8. Which one of the following statements about the solution of the equation

$$\begin{cases} x + 4y - 5z = 2 \\ 3x + 12y - 11z = 2 \\ x + 4y - 3z = 0 \end{cases}$$

is correct?

a. There are infinitely many solutions.

b. The solution is unique and $x = -3$.

c. The solution is unique and $y = 0$.

d. The solution is unique and $z = -1$.

e. There are no solutions.

9. The matrix $\begin{bmatrix} 1 & -1 & 1 \\ 0 & 1 & 3 \\ 3 & 2 & 2 \end{bmatrix}$ is pivoted about the circled entry. What is the entry in the first row and second column of the resulting matrix?

- a. 0 b. -1 c. -2 d. 2 e. 1

10. The augmented matrix of a system of equations is given by :

$$\begin{array}{cccc|c} & x & y & z & w & \\ \hline 1 & 1 & 1 & 4 & 5 \\ 0 & 0 & 1 & 1 & 3 \end{array}$$

What is the general solution to the system?

- | | | |
|---|---|--|
| <p>a. $x = 2 - 3w - y$
 $y = \text{any value}$
 $z = 3 - w$
 $w = \text{any value}$</p> | <p>b. $x = 5 - 4w - y$
 $y = \text{any value}$
 $z = 3 - w$
 $w = \text{any value}$</p> | <p>c. $x = 2$
 $y = 0$
 $z = 3$
 $w = 0$</p> |
| <p>d. $x = 5$
 $y = 0$
 $z = 3$
 $w = 0$</p> | <p>e. $x = 2 - y$
 $y = \text{any value}$
 $z = 3$
 $w = 0$</p> | |

11. Which one of the following statements about the solution to

$$\begin{cases} x + 2y + 3z = 1 \\ 2x + 5y + 7z = 2 \\ 3x + 5y + 7z = 4 \end{cases}$$

is correct?

- a. $x = 1$ b. $x = 2$ c. $x = -1$ d. $x = -2$ e. $x = 3$

12. Find the element in the second row and third column of the product

$$\begin{bmatrix} 1 & 0 & 2 \\ -1 & 1 & 2 \\ 0 & 1 & -1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 2 & 1 \\ 2 & 0 & 3 & 3 \\ 3 & 1 & 2 & 4 \end{bmatrix}$$

- a. 1 b. -1 c. 6 d. 4 e. 5

13. Let $A = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 \\ 3 & 4 \end{bmatrix}$. Find the entry in the first row and second column of the matrix $A + B$.

- a. 4 b. 3 c. -1 d. 0 e. 5

14. Given that A is a 3x4 matrix, B a 4x5 matrix, C a 3x5 matrix and D is a 5x4 matrix, which one of the following matrices is not defined?

- a. $A + ABD$ b. CDB c. $AB + C$ d. ABD e. $AB + CD$

15. Let $A = \begin{bmatrix} 1 & 1 & 2 \\ 2 & 1 & 2 \\ 2 & 0 & 1 \end{bmatrix}$. Find the entry in the second row and second column of A^{-1} .

- a. 1 b. -1 c. 3 d. $\frac{1}{5}$ e. $\frac{1}{2}$

16. Let $A = \begin{bmatrix} 1 & 3 \\ 1 & 2 \end{bmatrix}$. What is A^{-1} ?

- a. $\begin{bmatrix} 1 & 1 \\ 3 & 2 \end{bmatrix}$ b. $\begin{bmatrix} -2 & 1 \\ 3 & -1 \end{bmatrix}$ c. $\begin{bmatrix} 2 & -1 \\ -3 & 1 \end{bmatrix}$ d. $\begin{bmatrix} -2 & -1 \\ 3 & -1 \end{bmatrix}$ e.
 $\begin{bmatrix} -2 & 3 \\ 1 & -1 \end{bmatrix}$

17. Determine the value of y given that

$$A \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix} \quad \text{and} \quad A^{-1} = \begin{bmatrix} -1 & 0 & 1 \\ 2 & 1 & -1 \\ 3 & 0 & 1 \end{bmatrix}.$$

- a. 2 b. -3 c. 1 d. 0 e. 4

18. For what values of k , if any, does the system have infinitely many solutions?

$$\begin{array}{ccc|c} & x & y & z \\ \hline 1 & 1 & -2 & 1 \\ 0 & 1 & -1 & 1 \\ \hline 1 & 3 & k & 3 \end{array}$$

- a. For any value of k . b. $k = 0$ c. This system can never have infinitely many solutions.
- d. $k = -4$ e. $k = 3$

19. Monthly telephone bills for a large business are normally distributed with a mean of \$2000 and standard deviation \$400. How much money must the business budget each month for the phone bill in order to be 98% certain that the phone bill does not exceed the budget?

- a. \$2820 b. \$1180 c. \$3000 d. \$2800 e. \$2740

20. The probability distribution for a random variable X is given below. What is the variance of X ?

k	$\Pr(X=k)$
5	.1
6	.1
7	.5
8	.3

- a. .8 b. $\sqrt{.8}$ c. 0 d. 9.8 e. $\sqrt{9.8}$

