

College Algebra - Math 1050

Sample Exam III - 4 pages

Chapters 6 and 8

Time Limit: 50 Minutes

NAME: _____

The point value of each problem is in the left-hand margin. You must show your work to receive any credit for your answers, except on problems 1&2. Work neatly.

(6) 1. True or False.

() (a) The value of $\frac{6!}{2!}$ is $(\frac{6}{2})! = 3! = 6$.

() (b) The value of ${}_7P_6$ is 7 .

() (c) $\sum_{n=1}^4 (n-1)^2 = \sum_{k=0}^3 k^2$.

(6) 2. Fill in the blanks.

(a) The coefficient of the term x^7y^3 in the expansion of the expression $(x+y)^{10}$ is _____ .

(b) The probability of picking a red ball from a collection of five balls of which only one is red is _____ .

(c) The nonrecursive formula for the general term of the sequence 4, 7, 10, 13, ... is $a_n =$ _____ , where the starting value of n is one.

(10) 3. Use mathematical induction to prove that $1 + 3 + 5 + \cdots + (2n - 1) = n^2$ for $n = 1, 2, \dots$.

(8) 4. Evaluate $A(2B - C)$ where $A = \begin{bmatrix} 2 & -3 & 0 \\ 1 & 5 & -4 \end{bmatrix}$, $B = \begin{bmatrix} -4 & 1 \\ 0 & 7 \\ -3 & 2 \end{bmatrix}$, and $C = \begin{bmatrix} 0 & -3 \\ 6 & 2 \\ -4 & 0 \end{bmatrix}$.

(6) 5. Use the Cramer's rule to solve the system $\begin{cases} 3x - y = 7 \\ 6x + 5y = 0 \end{cases}$.

(10) 6. Evaluate the determinant $\begin{vmatrix} 3 & 2 & 4 \\ 4 & -2 & 6 \\ 8 & 3 & 5 \end{vmatrix}$.

- (10) 7. Find the inverse of the matrix $A = \begin{bmatrix} 2 & -3 \\ 4 & -5 \end{bmatrix}$ by using an augmented matrix and row operations.
(Do not apply the formula for the inverse of a nonsingular 2×2 matrix.)

- (8) 8. Write out the terms in the sum $\sum_{k=4}^6 (k^2 - 3k + 8)$ and then find its value.

- (10) 9. Consider the sequence $-3.25, -1.5, 0.25, 2, \dots$. Find its 101st term. Find the sum of its first 25 terms.

- (6) 10. (a) How many 4-letter passwords can be constructed if letters can be repeated? Note: there are 26 letters in the English alphabet.
- (b) How many 4-member committees can be picked from a group of the size 16?
- (c) In how many ways can 4 suspects be arranged in a lineup?
- (10) 11. What is the probability of getting a sum of 5 or a sum of 8, if two fair dice are rolled once?
- (10) 12. A group of people consists of 15 male sophomores, 10 female sophomores, 5 male seniors, and 20 female seniors. If a person is selected at random from this group, what is the probability that the selected person is a man or a senior.