DM Final Exam Review

Name Key

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Determine the order of the matrix.

1) $\begin{bmatrix} 2 \\ -1 \\ 6 \end{bmatrix}$

3 x 1

1) ~~3 x 2~~

Perform the indicated operation, if possible.

2) $\begin{bmatrix} -1 & 6 \\ -9 & 1 \\ 6 & -4 \end{bmatrix} + \begin{bmatrix} 5 & -6 \\ 2 & 6 \\ -7 & 6 \end{bmatrix}$

2) $\begin{bmatrix} 4 & 0 \\ -7 & 7 \\ -1 & 2 \end{bmatrix}$

3) $\begin{bmatrix} -1 & 5 \\ 0 & 4 \\ 8 & -4 \end{bmatrix} - \begin{bmatrix} 2 & 1 \\ 7 & 4 \\ 4 & 2 \end{bmatrix}$

3) $\begin{bmatrix} -3 & 4 \\ -7 & 0 \\ 4 & -6 \end{bmatrix}$

Find the indicated matrix.

4) Let B = [-1 2 7 -3]. Find -3B.

4) $\begin{bmatrix} 3 & -6 & -21 & 9 \end{bmatrix}$

5) Let $A = \begin{bmatrix} 1 & 3 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 4 \\ -1 & 6 \end{bmatrix}$. Find 2A + B.

5) $\begin{bmatrix} 2 & 10 \\ 3 & 16 \end{bmatrix}$

Find the matrix product, if possible.

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

6) $\begin{bmatrix} 2 & -2 \\ -10 & 2 \end{bmatrix}$

7) $\begin{bmatrix} -7 & -9 & -4 \\ -9 & -9 & -1 \end{bmatrix}\begin{bmatrix} 2 \\ 3 \\ 7 \end{bmatrix}$

7) $\begin{bmatrix} -69 \\ -52 \end{bmatrix}$

Find the indicated matrix product or state that the product is undefined.

8) $A = \begin{bmatrix} 6 & 9 \\ -5 & 9 \end{bmatrix}$, $B = \begin{bmatrix} -9 & 3 & -7 \\ 8 & -4 & 2 \end{bmatrix}$

8) undefined

BA

Determine the value of each variable.

9) [5 p+3 q-7] = [k+2 1 -9]

q = -2

9) k = 3 p = -2

Find the inverse of A if it has one, or state that the inverse does not exist.

10) $A = \begin{bmatrix} 0 & 2 \\ -1 & -2 \end{bmatrix}$

10) $\begin{bmatrix} -1 & -1 \\ 1/2 & 0 \end{bmatrix}$

11) $A = \begin{bmatrix} 1 & 0 & 8 \\ 1 & 2 & 3 \\ 2 & 5 & 3 \end{bmatrix}$

11) $\begin{bmatrix} 9 & -40 & 16 \\ -3 & 13 & -5 \\ -1 & 5 & -2 \end{bmatrix}$

Find the determinant of the given matrix.

12) $\begin{bmatrix} 5 & -2 & 2 \\ -3 & -5 & -4 \\ -2 & -4 & -2 \end{bmatrix}$

12) -30

Solve the system of equations by using an inverse matrix.

13) $-5x + 3y = 8$
$2x - 4y = -20$

13) $(2, 6)$

14) $x + 3y = -8$
$21x + 6y = 3$

14) $(1, -3)$

15) $8x - y + 6z = 95$
$3x + 8y - 4z = -6$
$9x - 4y + z = 58$

15) $(6, 1, 8)$

16) $5x - y - 6z = -34$
$-9x - 6z = -39$
$3y + z = 32$

16) $(1, 9, 5)$

State if each sequence is arithmetic.

17) 17, −3, −23, −43, ...

yes

State if each sequence is geometric.

18) −2, −12, −72, −432, ...

yes

Find the term named in the problem.

19) −21, −18, −15, −12, ...
Find a_{26}

$a_{26} = 54$

20) −2, −4, −8, −16, ...
Find a_{10}

$a_{10} = -1024$

Find the explicit formula.

21) 11, 20, 29, 38, ...

$a_n = 2 + 9n$

22) −4, −12, −36, −108, ...

$a_n = -4 \cdot 3^{n-1}$

Evaluate each arithmetic series described.

23) $\sum_{n=1}^{15} (9n - 3)$

1035

24) $a_1 = 15,\ a_n = 60,\ n = 10$

375

25) $a_1 = 3,\ d = 10,\ n = 10$

480

26) $29 + 39 + 49 + 59..., \ n = 7$

413

Evaluate each geometric series described.

27) $\sum_{i=1}^{9} 5^{i-1}$

488281

28) $a_1 = -4,\ r = 5,\ n = 8$

−390624

29) $4 - 24 + 144 - 864..., \ n = 6$

−266560

30) $a_1 = 4,\ a_9 = 262144,\ r = -4$

209716

31. A bucket contains 15 balls numbered 1 to 15. Mary randomly removes a ball, replaces it, and then randomly removes a ball again. What is the probability that Mary removes balls numbered greater than 6?

9/15

32. A bag contains 12 red balls, 15 yellow balls, and 9 white balls. If Brian randomly draws a ball from the bag, puts it aside and randomly draws another ball from the bag, what is the probability that Brian will draw 2 white balls?

2/35

33. A standard deck of playing cards has 52 cards. What is the probability of randomly picking a Queen or a black card from a standard deck?

28/52

34. Thirty students will participate in a spelling contest. How many outcomes for first, second, and third place are possible?

24,360

35. Richard has 15 shirts. 6 pairs of jeans, and 2 vests. How many different outfits, each composed of a shirt, a pair of jeans, and a vest, can he make?

180

36. This chart shows the number of students, by gender, in each grade at a local high school. The principal will randomly select on student to meet the governor.

	9th	10th	11th	12th
Female	80	95	75	80
Male	75	100	75	70

Let A = {choosing a male} and B = {choosing a tenth grader}. What is $P(B|A)$?

100/320

37. Box A contains marbles: 2 red, 6 blue, 4 green, and 5 yellow. Box B contains chips: 18 red, 17 green, 11 blue, and 12 yellow. If you randomly pick one item from each box, what is the probability that both items will be blue?

33/493

38. Consider the set of numbers {21, 29, 56, 98, 117, 156, 203}. What is the probability that a number randomly selected from the set is a mulitple of 7?

4/7

39. If a marble is randomly chosen from a bag that contains exactly 18 red marbles, 10 blue marbles, 17 white marbles, what is the probability that the marble will NOT be white?

28/45

40. What is the probability that a number selected at random from the set {2, 3, 7, 12, 15, 22, 72, 108, 410, 360, 600} will be divisible by both 2 and 3?

5/11

41. A jar contains 20 purple marbles and 222 red marbles. If two marbles are chosen at random with not replacement, what is the probability that 2 purple marbles are chosen?

.0045

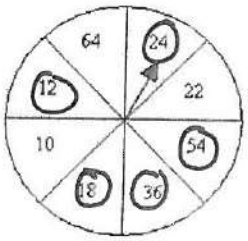
42. A die is rolled. What is the probability of rolling a 3 or a number greater than 2?

4/6

43. Evaluate ${}_7C_5$

21

44. This is a spinner used in a board game. What is the probability that the spinner will land on a multiple of 3 and 2?



5/8

45. The contingency table shows the results of a survey of college students. Find the probability that a student's first class of the day is a science class, given the student is female. Round to the nearest thousandth.

First Class of the Day for College Students

	Male	Female
Humanities	70	80
Science	50	80
Other	60	70

80/230