

Matrix Operations

MATH 204: Linear Algebra

Prepare for class October 3, 2018

Name (Print): _____

After reading Section 2.1 (pages 94-102), work through the following ideas.

1. Suppose A is an $m \times n$ matrix.

(a) What does $a_{i,j}$ represent?

(b) Make a list of the diagonal entries of A .

(c) What is a diagonal matrix? Give an example of a diagonal matrix if $m = n = 4$.

(d) Draw what A looks like if A is a zero matrix with $m = 5$ and $n = 2$.

2. What does it mean to say that matrix A is equal to matrix B ?

3. State Theorem 2.1: Basic Matrix Algebra for Scalar Multiplication and Addition. What properties does this say matrices have (i.e. can you name them)?

4. Complete the first two parts of Section 2.1 exercise 1 on page 102. That is, compute $-2A$ and $B - 2A$.

5. State the definition of matrix multiplication.

6. State the Product of Matrices and Linear Combinations of Columns Fact from page 97.

7. Using the matrices for Section 2.1 exercise 1 on page 102, compute AC or explain why it cannot be done?

8. Again, use the matrices for Section 2.1 exercise 1 on page 102 to answer the following.

(a) Compute CD using the row-column rule.

(b) Illustrating the Fact you quoted in question 6, show that the first column of CD is a linear combination of the columns of C .

(c) Compute DC using the row-column rule.

(d) What does your work above tell us about matrix multiplication? How is this different than real number multiplication?

9. State Theorem 2.2: Basic Matrix Algebra for Multiplication of Matrices.