

Midterm Test 1

Time: 70 minutes

Instructor:

Dr. Edward Doolittle

Name: _____

Student #: _____

Section: _____

You have 70 minutes to do each of the following questions. The test is worth a total of 50 marks. Non-programmable calculators, logarithm tables, and/or slide rules are permitted; no other aids are permitted. Use the backs of the pages for rough work.

- [10] 1. Solve the system of equations

$$\begin{aligned}x + y &= 9 \\4x - 5y &= -18\end{aligned}$$

2. Ms. Hardin invested \$40,000 in three stocks. The first year, stock A paid 6% dividends and increased in 3% in value; stock B paid 7% in dividends and increased 4% in value; and stock C paid 8% in dividends and increased 2% in value. The total dividends were \$2370 and the total increase in value was \$1080.

- [9] (a) Set up the system of equations that determine how many shares of each stock Ms. Hardin purchased.

[10] (b) Solve the system you found in part (a).

[1] (c) If the initial cost of a share of A was \$100, the initial cost of a share of B was \$200, and the initial cost of a share of C was \$300, what was the total number of shares purchased?

[5] 3. (a) Find the inverse of the matrix

$$\begin{bmatrix} -1 & 2 & -2 \\ -1 & 1 & -1 \\ 1 & -1 & 2 \end{bmatrix}$$

[5] (b) Check that you have the correct inverse.

- [10] 4. Perform row reduction on the matrix

$$\left[\begin{array}{cc|cc} a & b & 1 & 0 \\ c & d & 0 & 1 \end{array} \right]$$

to put it into reduced row echelon form. Under what conditions is that possible?