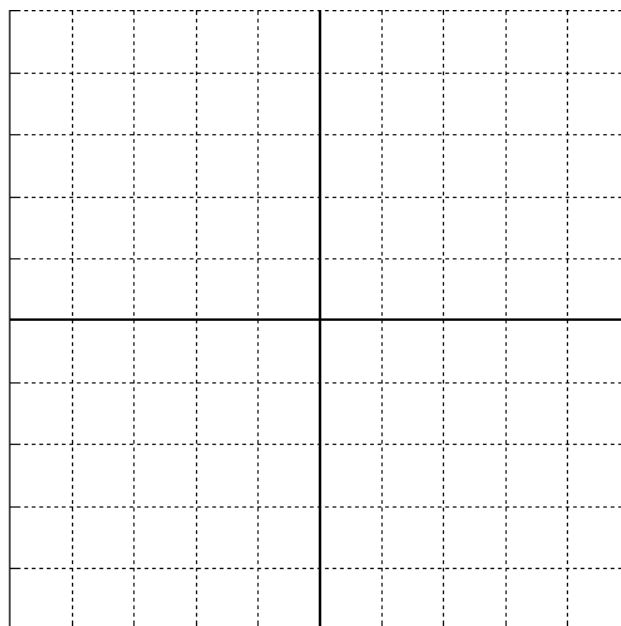


Complete the following assignment on a separate sheet of paper. Make sure to include your name and the homework set (HW 1) on each sheet of paper. For the MATLAB portion, print your results using the "Publish" feature in MATLAB (I will demonstrate this on Wednesday).

## VECTORS

- Draw the vectors  $\vec{u} = (2, 0)$  and  $\vec{v} = (-1, -2)$ , Starting from the origin
- Now find two numbers  $a$  and  $b$  such that  $a\vec{u} + b\vec{v} = (-3, -2)$
- Draw the vectors  $a\vec{u}$  and  $b\vec{v}$ , starting from the origin.
- Add the vectors  $a\vec{u} + b\vec{v}$  graphically.

Make sure to label all your vectors clearly.



## MATRIX MULTIPLICATION

Given the following matrices,

$$A = \begin{bmatrix} 2 & 4 \\ 5 & 2 \\ 1 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 0 & 2 & 2 \\ 4 & 1 & 0 \\ 5 & 3 & 5 \end{bmatrix} \quad C = [1 \quad 0 \quad 3] \quad D = \begin{bmatrix} 3 & 1 \\ 0 & 2 \\ 2 & 4 \\ 5 & 1 \end{bmatrix} \quad E = [0 \quad 1 \quad 0 \quad 4]$$

compute (by hand) the following matrix products. If the product cannot be computed, use the **transpose** operator on either or both of the matrices in order to carry out the multiplication, or state why this is impossible. Recall that the transpose operator (denoted by a superscript T <sup>"T"</sup>) switches the rows and column of a matrix (the 1<sup>st</sup> row becomes the 1<sup>st</sup> column, 2<sup>nd</sup> row becomes the 2<sup>nd</sup> column etc).

- $C \cdot B$
- $B \cdot A$
- $D \cdot E$
- $C \cdot E$
- $D \cdot A$
- $C \cdot D$

For a review of matrix multiplication, see page 19 of ch1.1-1.3.pdf from the course website.

## MATLAB PROBLEMS

See the MATLAB code template for further instructions.

(a) Matrix creation and indexing

$$M = \begin{bmatrix} 17 & 24 & 1 & 8 & 15 \\ 23 & 5 & 7 & 14 & 16 \\ 4 & 6 & 13 & 20 & 22 \\ 10 & 12 & 19 & 21 & 3 \\ 11 & 18 & 25 & 2 & 9 \end{bmatrix}$$

(b) Gentle introduction to “for” loops.

## MATLAB INTRO

Visit: <http://goo.gl/zZTrvc> and watch the video “Solving a Sudoku Puzzle Using a Webcam” (6 minutes). Write a short “recipe” describing the steps that the MATLAB program follows in the video. Your recipe should be written at a “high level,” which means you should have between 5 and 10 steps, and each step should be one to two short sentences.