CS-411 – Homework 0 (0%)

Linear Algebra Reminder. Due by: September 5, 2017

A. Let: $A = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$, $B = \begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$, $C = \begin{bmatrix} -1 \\ 1 \\ 3 \end{bmatrix}$, find:

1. $2A - B$
2. $||A||$ and the angle of A relative to the positive X axis
3. $\hat{A}$, a unit vector in the direction of A
4. the direction cosines of A
5. $A \cdot B$ and $B \cdot A$
6. the angle between A and B
7. a vector which is perpendicular to A
8. $A \times B$ and $B \times A$
9. a vector which is perpendicular to both A and B
10. the linear dependency between A, B, C

B. Let: $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & -2 & 3 \\ 0 & 5 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 1 & -4 \\ 3 & -2 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ -1 & 1 & 3 \end{bmatrix}$, find:

1. $2A - B$
2. AB and BA
3. $(AB)^T$ and $B^T A^T$
4. $|A|$ and $|C|$ (note A-10)
5. the matrix (A, B, or C) in which the row vectors form an orthogonal set
6. A^{-1} and B^{-1} (note B-5)

C. Let: $f(x) = x^2 + 3, \quad g(x, y) = x^2 + y^2$, find:

1. the first and second derivatives of $f(x)$ with respect to x: $f'(x)$, and $f''(x)$.
2. the partial derivatives: $\frac{\partial g}{\partial x}$, and $\frac{\partial g}{\partial y}$.

Submission instructions

- Prepare your solution in a pdf file (either type and export to pdf, or hand write and scan/photograph).
- Create a free bitbucket account or use your existing account if you have one (http://bitbucket.org).
- Create a PRIVATE project **cs411-f17-FIRST-LAST** where FIRST/LAST are your first/last name.
- Share this project (give read permission) with **cs411iit**
- Inside your project create a folder called AS0 and upload your assignment file there.