CS1675 Recitation #3
9/14/2018

Linear algebra review problems

The following two example problems are from `http://web.pdx.edu/~erdman/LINALG/Linalg_pdf.pdf`:

2.2. Exercises

(1) Let $A = \begin{bmatrix} 1 & 0 & -1 & 2 \\ 0 & 3 & 1 & -1 \\ 2 & 4 & 0 & 3 \\ -3 & 1 & -1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ 3 & -1 \\ 0 & -2 \\ 4 & 1 \end{bmatrix}$, and $C = \begin{bmatrix} 3 & -2 & 0 & 5 \\ 1 & 0 & -3 & 4 \end{bmatrix}$.

(a) Does the matrix $D = ABC$ exist? _____ If so, then $d_{34} =$ _____.
(b) Does the matrix $E = BAC$ exist? _____ If so, then $e_{22} =$ _____.
(c) Does the matrix $F = BCA$ exist? _____ If so, then $f_{43} =$ _____.
(d) Does the matrix $G = ACB$ exist? _____ If so, then $g_{31} =$ _____.
(e) Does the matrix $H = CAB$ exist? _____ If so, then $h_{21} =$ _____.
(f) Does the matrix $J = CBA$ exist? _____ If so, then $j_{13} =$ _____.

(3) Let $A = \begin{bmatrix} 1 & 1/3 \\ c & d \end{bmatrix}$. Find numbers c and d such that $A^2 = -I$.

Answer: $c =$ _____ and $d =$ _____.

Differentiation review problems

The following two example problems are from `http://www.math.mcgill.ca/rags/JAC/dobson/diff.pdf`. For all problems, find d/dx. Note that $d/dx\ ln(x) = 1/x$.

4. $y = \left(e^{x^2+2}\right)^2$

35. $y = \ln \cos x$

40. $y = \frac{\sqrt{x}+1}{\sqrt{x}-1}$