MATRIX BASICS

Exercise 1: State the ORDER of these matrices:

a) $\begin{pmatrix} 1 & 1 & 1 \end{pmatrix}$

b) $\begin{pmatrix} 1 \\ 4 \\ 29 \end{pmatrix}$

c) $\begin{pmatrix} 4 & 7 & 9 & 1 \\ 1 & 16 & 11 & 5 \\ 6 & 2 & 2 & 8 \end{pmatrix}$

d) $\begin{pmatrix} 7 & 4 \\ 15 & 4 \\ 1 & 5 \\ 3 & 10 \\ 29 & 2 \end{pmatrix}$

e) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

f) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

Exercise 2: State the element, a_{ij}, for the following matrices:

a) $\begin{pmatrix} 1 & 2 & 3 \end{pmatrix}$ $a_{1,2}$

b) $\begin{pmatrix} 4 & 23 & 19 \\ 7 & 7 & 8 \\ 3 & 30 & 1 \end{pmatrix}$ $a_{2,3}$

c) $\begin{pmatrix} 15 \\ 11 \\ 14 \end{pmatrix}$ $a_{3,1}$

d) $\begin{pmatrix} 0 & 0 & 1 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$ $a_{2,2}$

e) $\begin{pmatrix} 1 & 2 \\ 2 & 4 \end{pmatrix}$ $a_{2,1}$

f) $\begin{pmatrix} 9 & 10 & 11 \\ 13 & 3 & 2 \\ 8 & 1 & 5 \\ 7 & 7 & 7 \end{pmatrix}$ $a_{4,3}$

Exercise 3: Identify the following types of matrix from the list below

a) SQUARE

b) DIAGONAL

c) IDENTITY

d) UPPER TRIANGULAR

e) LOWER TRIANGULAR

f) NULL / ZERO

HINT: there may be more than one answer for each!

i) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

ii) $\begin{pmatrix} 4 & 7 & 3 & 8 \\ 1 & 2 & 3 & 7 \\ 5 & 6 & 8 & 1 \\ 2 & 4 & 8 & 6 \end{pmatrix}$

iii) $\begin{pmatrix} 5 & 0 & 0 \\ 0 & 1.1 & 0 \\ 0 & 0 & -7 \end{pmatrix}$

iv) $\begin{pmatrix} 4 & 1 & 7.9 \\ 0 & 2 & 6 \\ 0 & 0 & 3 \end{pmatrix}$

v) $\begin{pmatrix} 3 & 0 & 0 \\ 1 & 2 & 0 \\ 4 & 5 & 9 \end{pmatrix}$

vi) $\begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}$