Dawson College: Linear Algebra: 201-NYC-05 06 March 4, 2010

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 5 (B)

Question 1. *(3 marks)* Let:

$$A = \begin{bmatrix} 4 & -1 & 1 \\ 1 & 3 & -2 \\ 4 & 1 & 0 \end{bmatrix}$$

Find C_{32}.

$C_{32} = (-1)^{3+2} \det \begin{bmatrix} 4 & 1 \\ 1 & -2 \end{bmatrix} = -(-8-1) = 9$

Question 2. *(3 marks)* Find the determinants of the following matrices (justify your answer):

(a) $A = \begin{bmatrix} 2 & 0 & 8 & -6 \\ 3 & -3 & 1 & 3 \\ 1 & 0 & 1 & -1 \\ 1 & 0 & 4 & -3 \end{bmatrix}$ **(b)** $B = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -3 & 0 & 0 \\ 2 & 0 & 5 & 0 \\ 22 & -1 & 1 & 2 \end{bmatrix}$ **(c)** $C = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

$\det A = 0$ ($R_1 = 2R_3$)

$\det B = (1)(-3)(5)(2) = -30$ (UPPER TRIANGULAR)

$\det C = -1$ ($I_{R_1 \leftrightarrow R_2}$ C)

Question 2. *(4 marks)* Find the following determinant:

$$\det \begin{bmatrix} 1 & 2 & 0 & 1 \\ 3 & -2 & 1 & 0 \\ 3 & -1 & 0 & 1 \\ 0 & 1 & 0 & 4 \end{bmatrix}$$

(COLUMN 3)

$= 0 - (1) \det \begin{bmatrix} 1 & 2 & 1 \\ 3 & -1 & 1 \\ 0 & 1 & 4 \end{bmatrix} + 0 - 0$

(ROW 3)

$= -\left(0 - \det \begin{bmatrix} 1 & 1 \\ 3 & 1 \end{bmatrix} + 4 \det \begin{bmatrix} 1 & 2 \\ 3 & -1 \end{bmatrix} \right)$

$= -[-(1-3) + 4(-1-6)]$

$= -(2-28) = 26$