Quiz 5
Math 314

Name: Key

3/18/08

1. Using Cramer's rule, give the value of y for the solution to

$$\begin{pmatrix} 2 & -3 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}.$$

(Do *not* give the value for x.)

$$y = \frac{\begin{vmatrix} 2 & 1 \\ 3 & 2 \end{vmatrix}}{\begin{vmatrix} 2 & -3 \\ 3 & 4 \end{vmatrix}} = \frac{1}{17}$$

2. For $A = \begin{pmatrix} 1 & 2 & -2 \\ 3 & 1 & 1 \\ 0 & -1 & 0 \end{pmatrix}$, give the (1,1) and (1,2) entries of A^{-1} by using the formula involving cofactors. Simplify your answers completely.

$$A^{-1} = \frac{1}{\det A}\left(\mathrm{Cof}(A)\right)^T \qquad \det A = -(-1)\begin{vmatrix} 1 & -2 \\ 3 & 1 \end{vmatrix} = 1 + 6 = 7$$

So 1-1 entry is $\frac{1}{\det A} C_{11} = \frac{\begin{vmatrix} 1 & 1 \\ -1 & 0 \end{vmatrix}}{7} = \frac{1}{7}$

1-2 entry is $\frac{1}{\det A} C_{21} = \frac{-\begin{vmatrix} 2 & -2 \\ -1 & 0 \end{vmatrix}}{7} = \frac{-(-2)}{7} = \frac{2}{7}$