

# Homework #3

Math 2010  
Due Monday, October 4

You must **show all work** to receive full credit. **No work = no credit.**

1. Find the values of  $a$  and  $b$  for which both

$$A = \begin{bmatrix} a+b-1 & 0 \\ 0 & 3 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 5 & 0 \\ 0 & 2a-3b-7 \end{bmatrix}$$

are *not* invertible.

2. If it exists, find the inverse of

$$A = \begin{bmatrix} 1 & 2 & 2 \\ 3 & 7 & 9 \\ -1 & -4 & -7 \end{bmatrix}$$

3. Find the determinant by hand for

$$A = \begin{bmatrix} 2 & 6 & 6 & 2 \\ 2 & 7 & 3 & 6 \\ 1 & 5 & 0 & 1 \\ 3 & 7 & 0 & 7 \end{bmatrix}$$

4. Solve for  $x$ :

$$\begin{vmatrix} x+3 & 2 \\ 1 & x+2 \end{vmatrix} = 0$$

5. Use Cramer's rule to find  $x_3$  in the system

$$\begin{array}{rclcl} 3x_1 & + & 4x_2 & + & 4x_3 & = & 11 \\ 4x_1 & - & 4x_2 & + & 6x_3 & = & 11 \\ 6x_1 & - & 6x_2 & & & = & 3 \end{array}$$