

**Quiz 2(10 pts)**  
Math 220, Spring 2008  
Due Tuesday, February 19.

**NAME:**

**STUDENT ID NUMBER:**

**SHOW YOUR WORK!**

**Problem 1.** (5pts) a) Describe all solutions of  $A\vec{x} = \vec{0}$  in parametric form, where  $A$  is following matrix:

$$A = \begin{bmatrix} 1 & 3 & -3 & 7 \\ 2 & 6 & -10 & 19 \end{bmatrix}$$

b) How geometrically the set of solutions looks like? Possible answers are: a point, a line, a plane, a 3d space.

**Problem 2.** (5pts) a) Is  $\vec{\mathbf{u}}$  in the plane  $\mathbb{R}^2$  spanned by the columns of  $A$ ? Explain why or why not. If you only write yes or no without a solution you will get 0 points.

$$\vec{\mathbf{u}} = \begin{bmatrix} 0 \\ 4 \\ 4 \end{bmatrix}, \quad A = \begin{pmatrix} 3 & -5 \\ -2 & 6 \\ 1 & 1 \end{pmatrix}$$

b) Find what condition coordinates  $b_1, b_2$  and  $b_3$  must satisfy so the vector  $[b_1, b_2, b_3]$  was in the span of the columns of the matrix  $A$  from the part a).