## QUIZ 7 - MATH 305 Your Name:

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

- 1. Prove or provide a counterexample:
  - (a)  $H = \{at^2 + 3 : a \in \mathbb{R}\}$  is a subspace of  $\mathbb{P}_2$ .

(b)  $H = \{f(t) \in F(\mathbb{R}) : f(t) \text{ is a solution of } y'' + 2y' + 3y = 0\}$  is a subspace of  $F(\mathbb{R})$ .

2. Consider

$$H = \left\{ \begin{bmatrix} a+b\\b-c\\c+a\\a+b+c \end{bmatrix} : a,b,c \in \mathbb{R} \right\}.$$

(a) Is H a subspace of  $\mathbb{R}^3$ ?

(b) Is H a subspace of  $\mathbb{R}^4$ ?

(c) Show a generating set for H.