

Name: \_\_\_\_\_

Recitation Section: \_\_\_\_\_

**Math 1553 Quiz 3, Fall 2018: Sections 3.1 and 3.2 (10 points, 10 minutes)**

Show your work unless instructed otherwise! A correct answer without appropriate work will receive little or no credit.

1. (2 points) Complete the following mathematical definition of linear combination (Be precise! You cannot use "span" in the definition of linear combination).

Let  $w, v_1, v_2, \dots, v_p$  be vectors in  $\mathbf{R}^n$ . We say  $w$  is a *linear combination* of  $v_1, v_2, \dots, v_p$  if...

2. (3 points) True or false. Circle TRUE if the statement is always true. Otherwise, circle FALSE. You do not need to justify your answer.

a)  $\text{Span}\left\{\begin{pmatrix} 5 \\ 2 \end{pmatrix}\right\}$  contains the zero vector  $\begin{pmatrix} 0 \\ 0 \end{pmatrix}$ .      TRUE      FALSE

b)  $\text{Span}\left\{\begin{pmatrix} 1 \\ 2 \\ 1 \end{pmatrix}, \begin{pmatrix} -2 \\ -4 \\ -2 \end{pmatrix}\right\}$  is a plane.      TRUE      FALSE

- c) Determining whether a vector equation  $x_1v_1 + x_2v_2 = b$  has a solution is the the same as determining whether  $v_1$  is in  $\text{Span}\{v_2, b\}$ .

TRUE      FALSE

3. (5 pt) Find all values of  $h$  so that  $\begin{pmatrix} -1 \\ -7 \\ h \end{pmatrix}$  is a linear combination of  $\begin{pmatrix} 1 \\ -2 \\ 1 \end{pmatrix}$  and  $\begin{pmatrix} -2 \\ 1 \\ 3 \end{pmatrix}$ .

Show your work!