

Quiz 1
MATH 2184-10 - Linear Algebra
Summer 2017

Total Points: 30

Total Time: 20 minutes

Name: _____

Date: 2017-05-30

Read all of the following information before starting the quiz:

- Show all work, clearly and in order, to get full credit.
- Do not use calculators.
- Circle or otherwise indicate your final answers.

1. Write true or false.

Let A be a 3×2 matrix with **two pivot positions**. Define a transformation T by $T(x) = Ax$.

- (a) The domain of T is \mathbb{R}^3 . _____ [10]
- (b) The co-domain of T is \mathbb{R}^2 . _____
- (c) The equation $Ax = 0$ is consistent. _____
- (d) The equation $Ax = 0$ has a nontrivial solution. _____
- (e) The equation $Ax = b$ has a solution for all b . _____

2. Describe all the solutions of $Ax = 0$ in the parametric vector form where [10]

$$A = \begin{bmatrix} -1 & -4 & 0 & -4 \\ 2 & -8 & 0 & 8 \end{bmatrix}.$$

3. For what value(s) of h is the set $\{v_1, v_2, v_3\}$ linearly dependent?

[10]

$$v_1 = \begin{bmatrix} 1 \\ -3 \\ -5 \end{bmatrix}, v_2 = \begin{bmatrix} -3 \\ 9 \\ 15 \end{bmatrix}, v_3 = \begin{bmatrix} 2 \\ -5 \\ h \end{bmatrix}$$