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| Assessment 6Dusty Wilson Math 220 No work = no credit **Non CAS Calculators allowed** | **Name**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *I wrote it out five times, may it last the same number of millennia.* Girolamo Cardano 1501 - 1576 (Italian mathematician) |

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| Warm-ups (1 pt each): | =\_\_\_\_\_ | =\_\_\_\_\_ |  |

(1 pt) The quote speaks to Cardano’s desire to have a lasting name. Prior to this course had you heard of Cardano? What does this remind us about our lasting legacy.

(10 pts) Consider the matrix ****

1. Find a basis for the column space of *A*.

1. Find the null space of *A*.
2. rank(*A*) = \_\_\_\_\_ and nullity(*A*) = \_\_\_\_

(4 pts) True or False. (1 point per problem is for an explanation/justification):

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| (a.) The column space of a 3x4 matrix is a subspace of | (b.) A linearly independent set in a subspace *H* is a basis for *H*. |

(6 pts) Define the following:

1. What does it mean if  are linearly independent?
2. What is the span of .
3. How do we know if are a basis for a subspace *V* of ?

(4 pts) Find the coordinate vector  of  relative to the basis 

(4 pts) Suppose that  is a subset of *V* and *T* is a one-to-one linear transformation, so that the equation  always implies  . Prove that if the set of images  is linearly dependent, then  is linearly dependent.

(4 pts) Show that the set *H* of all matrices of the form  are a subspace of (the space of all 2x2 matrices).