

Group: \_\_\_\_\_ Present: \_\_\_\_\_

1. Find an element in the span of the set  $\{[-1, 2, 1], [2, 5, 1]\}$  which has its third entry equal to zero and its first two entries positive.

2. Proposition 1: Let  $A$  be an element of a vector space  $V$ . Then  $(-1)A = -A$ .

Let's prove this. First, understand the meaning of  $(-1)A$  and  $-A$ :

$(-1)A$  is:

$-A$  is:

Let's show that  $(-1)A$  has the property that  $-A$  has (justify each step with a vector space property or a property of ordinary arithmetic):

$$\begin{aligned} A + (-1)A &= 1A + (-1)A && \underline{\hspace{2cm}} \\ &= (1 + (-1))A && \underline{\hspace{2cm}} \\ &= \underline{\hspace{1cm}}A && \underline{\hspace{2cm}} \\ &= \underline{\hspace{1cm}} && \underline{\hspace{2cm}} \end{aligned}$$

State conclusion:

3. Explain why each of the following is always True, sometimes True, or False.
  - (a) A subset of an independent set is independent.
  - (b) A subset of a dependent set is dependent.
  - (c) If a set of elements of a vector space is dependent, then each element of the set is a linear combination of other elements of the set.
  - (d) A set of vectors which contains the zero vector is dependent.