

Math 1210 Tutorial 10

1. Determine whether the following sets of vectors are linearly independent or linearly dependent. Justify your answers

(a) $\langle 3, 2, -1 \rangle, \langle -4, 2, 6 \rangle, \langle 5, -1, 2 \rangle$

(b) $\langle 3, 2 \rangle, \langle 5, -1 \rangle, \langle 6, -23 \rangle$

(c) $\langle 4, 2, -1, 2 \rangle, \langle 2, -3, 1, 0 \rangle, \langle 1, 2, -3, 4 \rangle$

2. (a) Verify that the vectors

$$\mathbf{u} = \langle 2, 1, -3, 0 \rangle, \quad \mathbf{v} = \langle 5, -1, 2, 3 \rangle, \quad \mathbf{w} = \langle 0, -7, 19, 6 \rangle$$

are linearly dependent.

(b) Express \mathbf{u} in terms of \mathbf{v} and \mathbf{w} .

Answers:

1. (a) Linearly independent (b) Linearly dependent (c) Linearly independent

2. (b) $\mathbf{u} = \frac{2}{5}\mathbf{v} - \frac{1}{5}\mathbf{w}$