Problem 33

*Suppose is a basis of ;*

*where and*

*Let be the linear operator for which*

*and*

*Find a formula for ; and use that formula to find .*

[1] x,y as linear combination of and

Let



[2] Solve for system







[3] Formula for

*Given and*

[4] Find *.*

Problem 34

*Let ; ; and be vectors in a vector space ;*

*and let be a linear transformation for which*

*Find*

[1] Linearity Property

Thus,

Problem 35

Let A be a 7x6 matrix such that Ax = 0 has only the trivial solution.

If is multiplication by A; then find the nullity and rank of T.

[1] Nullity of T

Zero

[2] Rank of T

6

Problem 36

Let T be multiplication by the matrix

1. Find a basis for the kernel of T.

2. Find a basis for the range of T.

[1] Solve for system

R2: R2 + 1/3R1

R3: R3 + 2/3R1

R3: R3 – R2

R2: R2/2

R1: R1-13/6R2

R1: R1/3

Basis for the kernel:

Basis for the range: