Homework 2

1. p.76-77 Ex.24(a)(b)
   1. is the vector space, and are subspaces of , such that

For we have ,

meaning that [y-axis] and [x-axis] ,

as and .

[projection on , along ].

* 1. is the vector space, and are subspaces of , such that

For we have .

We are given that, which is

meaning that [y-axis] and [] ,

as and .

[projection on , along ].

A picture containing chart

Description automatically generated

1. p.77 Ex.28

subspace of is said to be T-invariant if for every , that is .

1. is T-invariant
2. is T-invariant
3. If, , then . Therefore, we have that, , hence it follows that is T-invariant
4. If, , then . Then if, then .

Also, and hence,

Therefore, , is T-invariant

1. p.85 Ex.11

, , and is T-invariant (i.e., for every , that is ).

We have vector space , and its T-invariant subspace , we take to be the basis of , we know we can extend it to be , the basis of .

Since , that is for unique scalars .

Let and is the .

Then, .

1. p.97 Ex.9

We take and , we then define:

by and by

If we say that, , then , , which then gives us that

We then take,

We then use the above example…

and ,

then we have and .

1. p.97 Ex.11

Let such that . We can assume thar . We then know that as , then . Hence, .

Since we know that is linear, then we know . Finally, since consists of .

, when

1. p.97 Ex.13

We have,

Let:

Since we know that , it can be easily seen in the examples below…

1. p.116 Ex.2(d)

1. p.116 Ex.4

1. p.141 Ex.3(a)

gives

1. p.141 Ex.3(b)

gives