di What were the a nswers??

Section A

a. [(1,1,-2)T]

Basis of intersection:T

b.

i.

Eigen values = 1, 2

ii.

Not diagonalisable

C.

I. No, Ψ(0) = (-2,0,0), so the mapping is not linear.

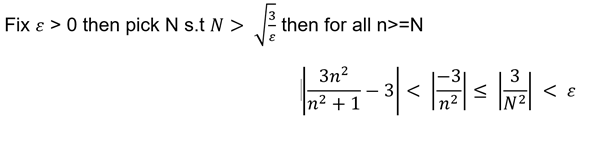
ii.

iii.

Not a subspace

Section B

1. Proof of convergence:

-

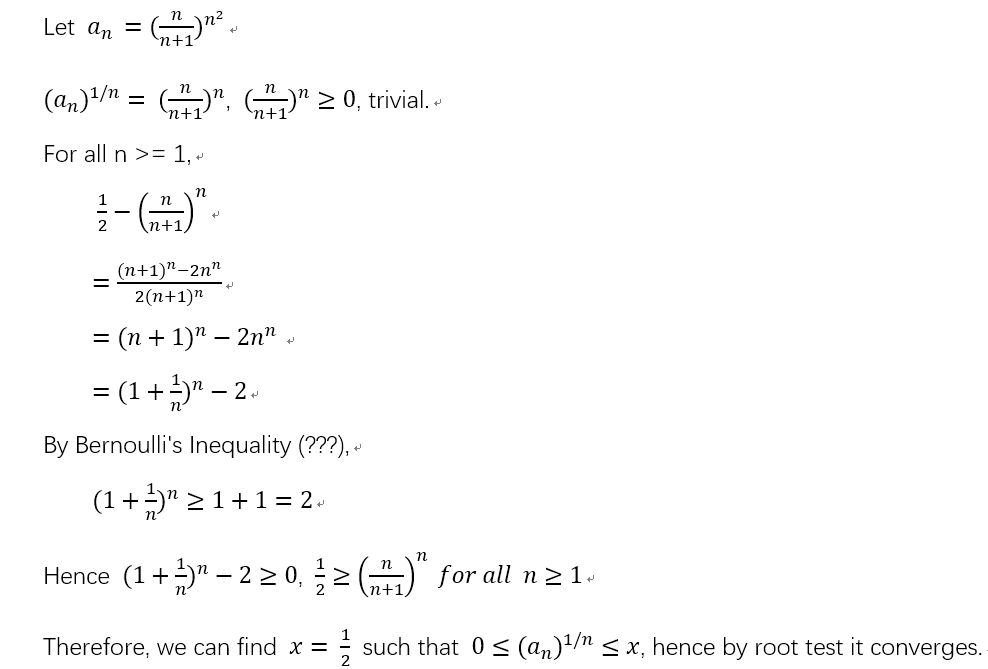
Lots of proofs of convergence / divergence.

b.

-x - (x^2)/2 + (x^3)/6

c.

i) Disclaimer: I did not have time to write that down in the actual exam, and I am sure there is a better method to do it since my method needs to use Bernoulli’s inequality which we haven’t learnt yet during lectures...



Alternative

definition of e

ii) let a{n} = 1/n

Consider use L’Hopital to get = 0

Thus if ln(\_) = 0, \_ = 1 so lim of a{n} = 1

Repeat for when a{n} = 1/n^2

We know that the infinite sum of 1/n diverges (from lecture notes)

But infinite sum of 1/n^2 converges (from lecture notes)

Since they both give 1 in the root test, the root test doesn’t tell us anything about convergence/divergence when L = 1.