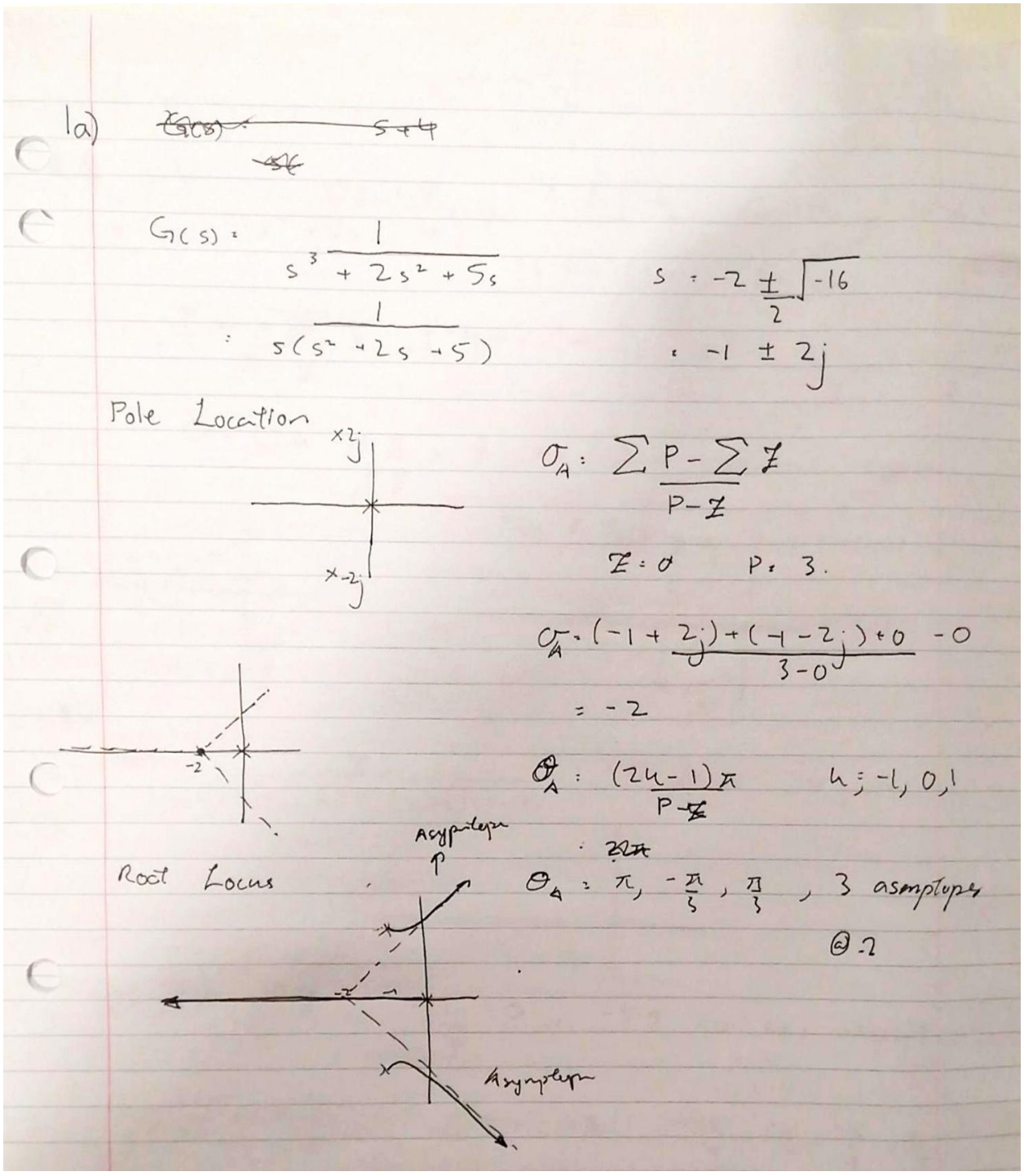
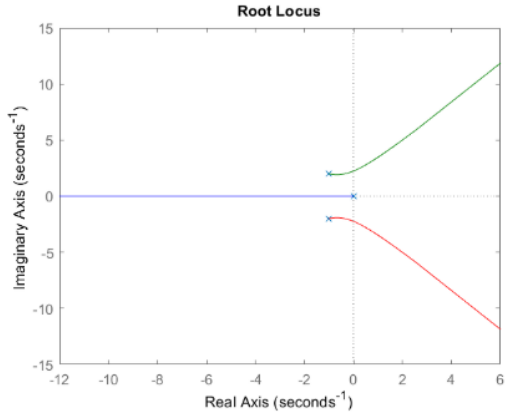
Question 1

1a)

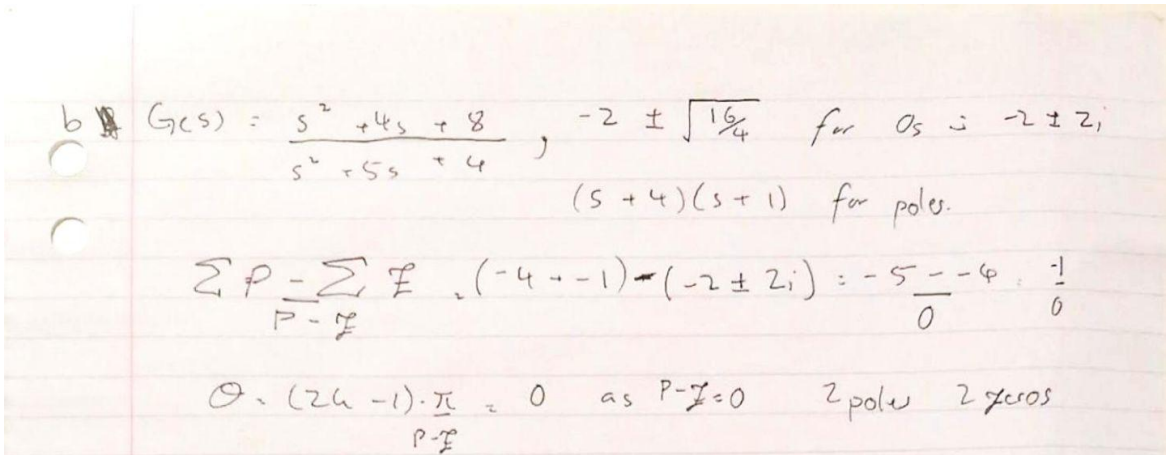


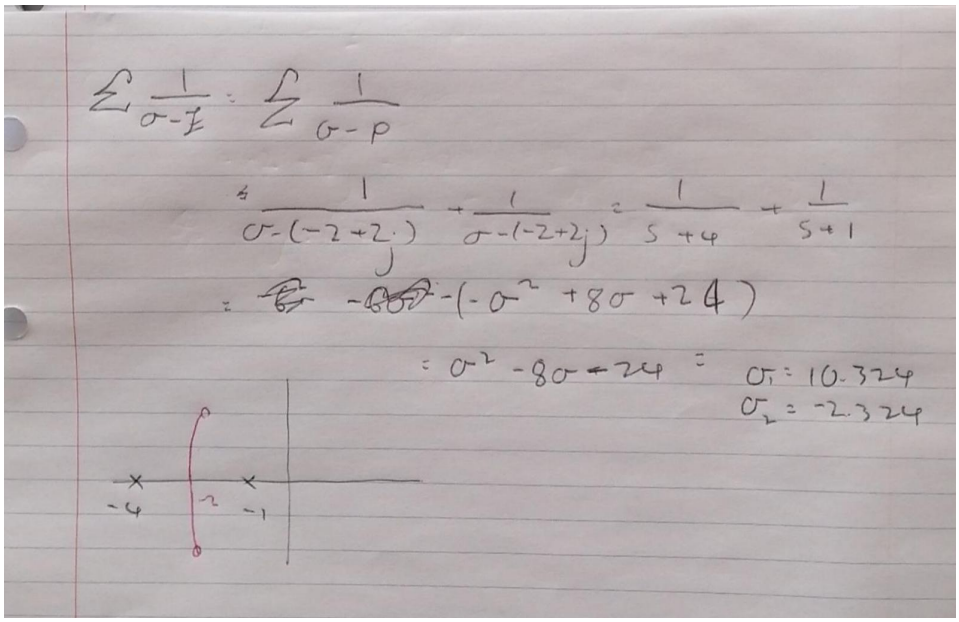
edit: i noticed the centroid of asymptote is slightly miscalculated; it's meant to be -⅔ as opposed to -2. No real axis intercept as it doesn't touch the real axis.

```
sys =

          1
  -----------------
  s^3 + 2 s^2 + 5 s

Continuous-time transfer function.
```



1b)





```
  s^2 + 4 s + 8
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s^2 + 5 s + 4

Continuous-time transfer function.
```
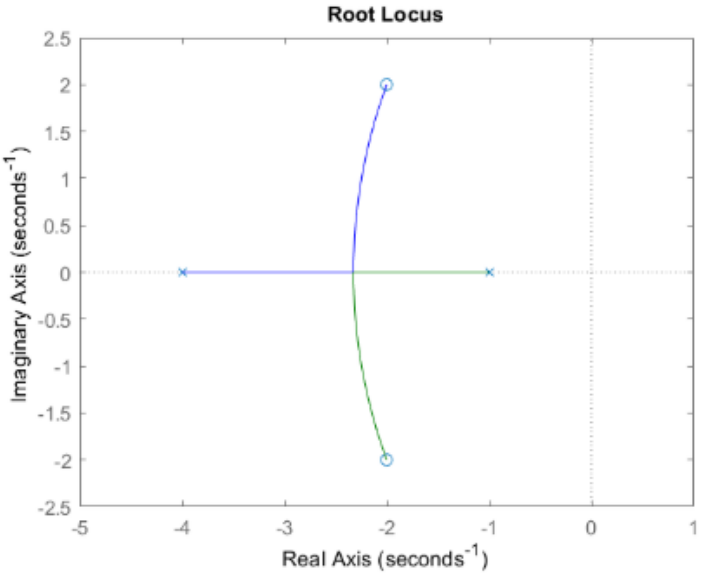
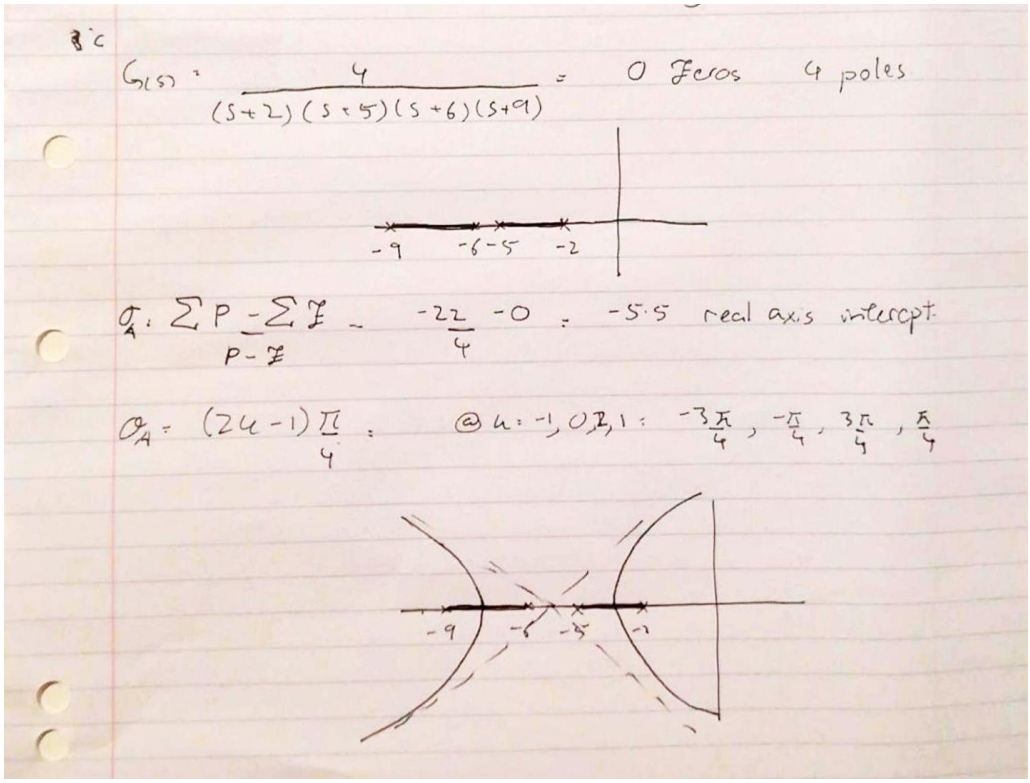
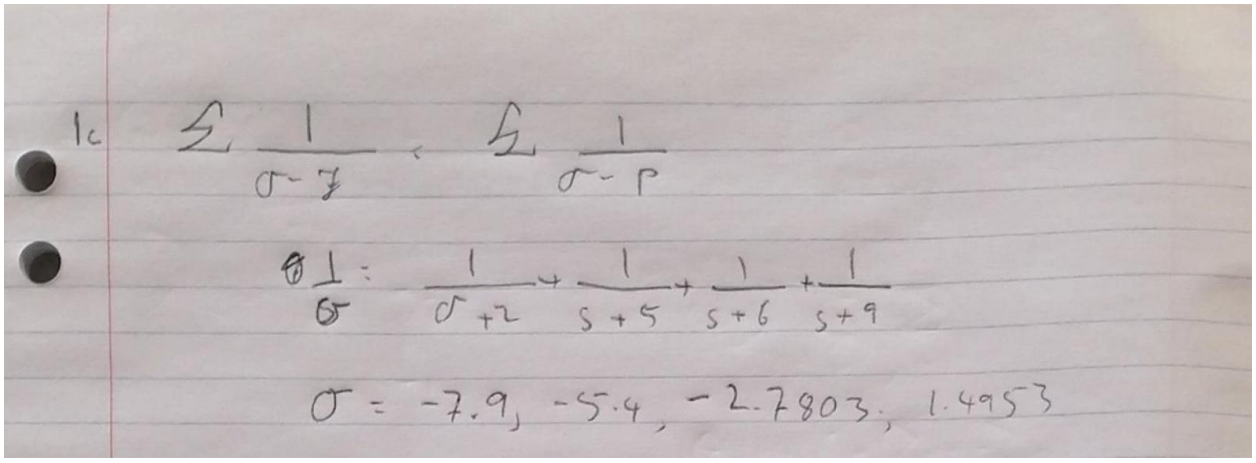



Not exactly spot on but looks very similar

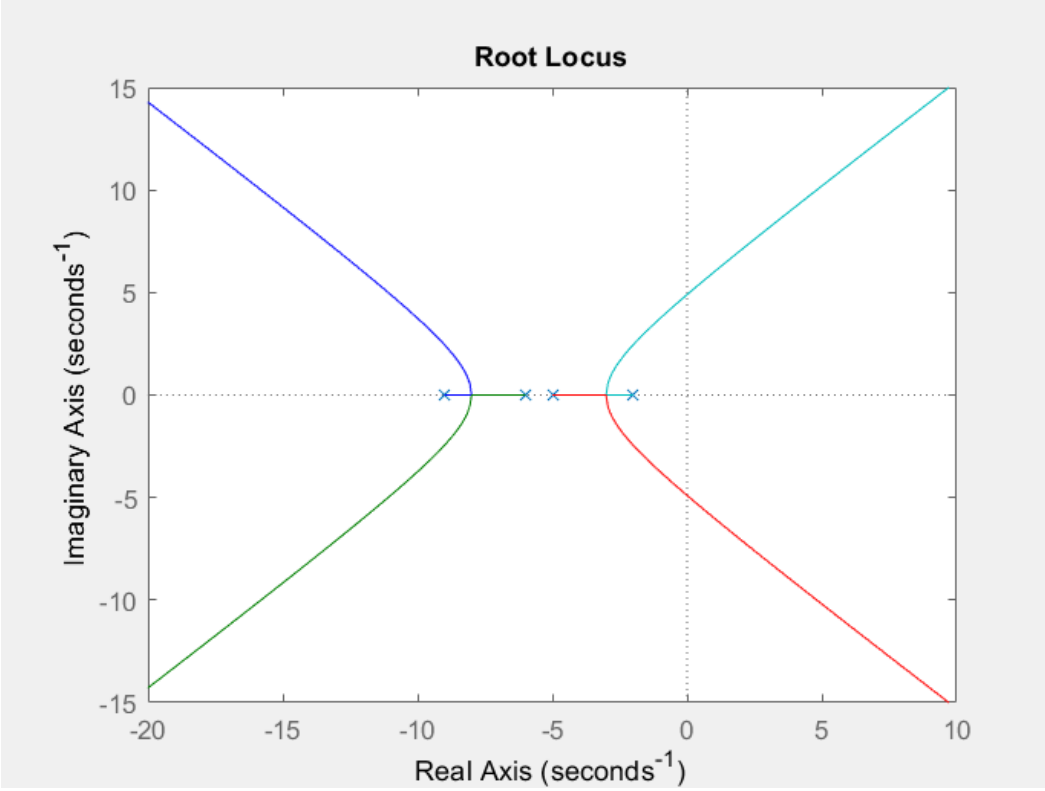
1c)



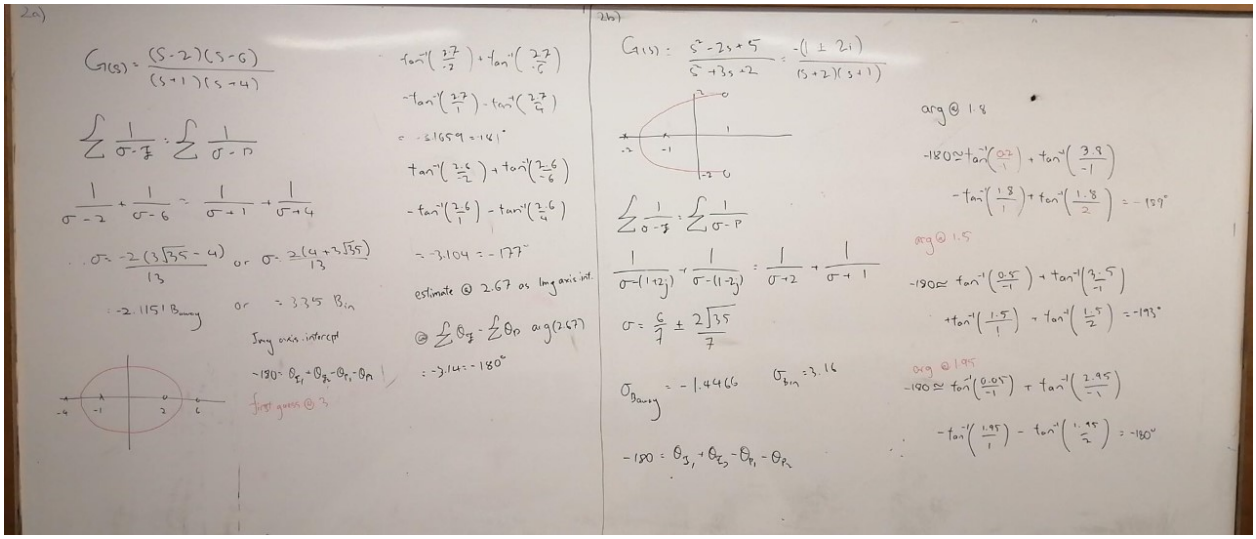
-5.5 is not the real axis intercept. It's the centroid.



Real axis intercept is -7.9 and -2.7 since -5.4 is not between the connection of the poles.



Question 2



It doesn't go into 3.16 on the real axis as it's canceled by the zeros.

Verification via matlab

```
s^2 - 8 s + 12
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s^2 + 5 s + 4

Continuous-time transfer function.
```
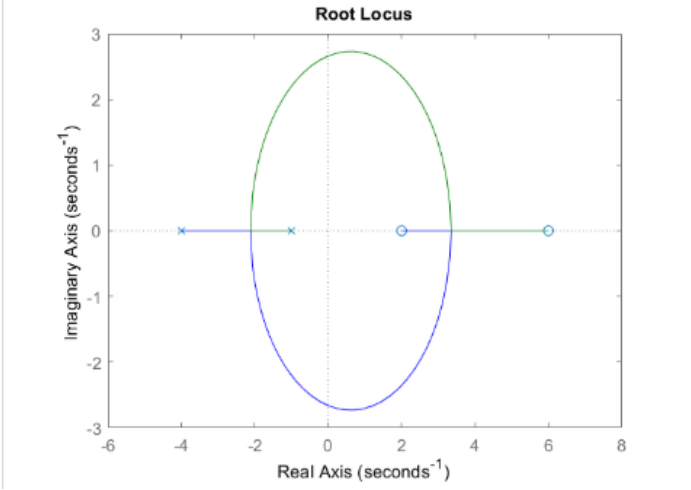
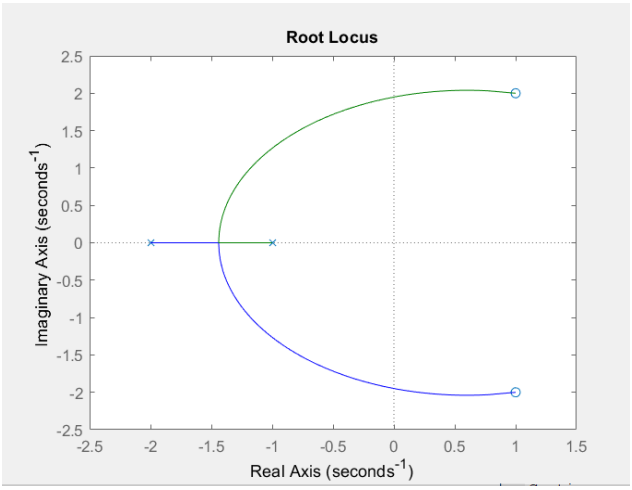
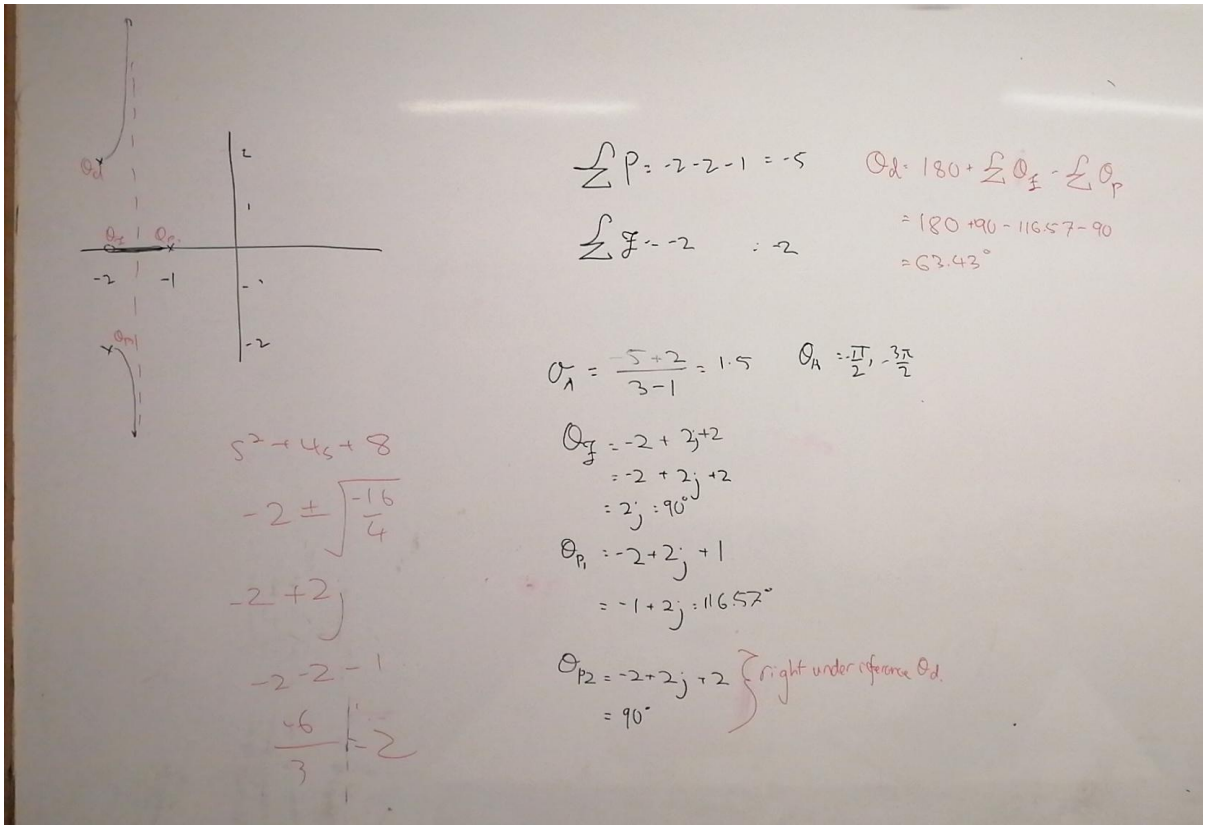





3)



Angle of departure is 63.43 degrees