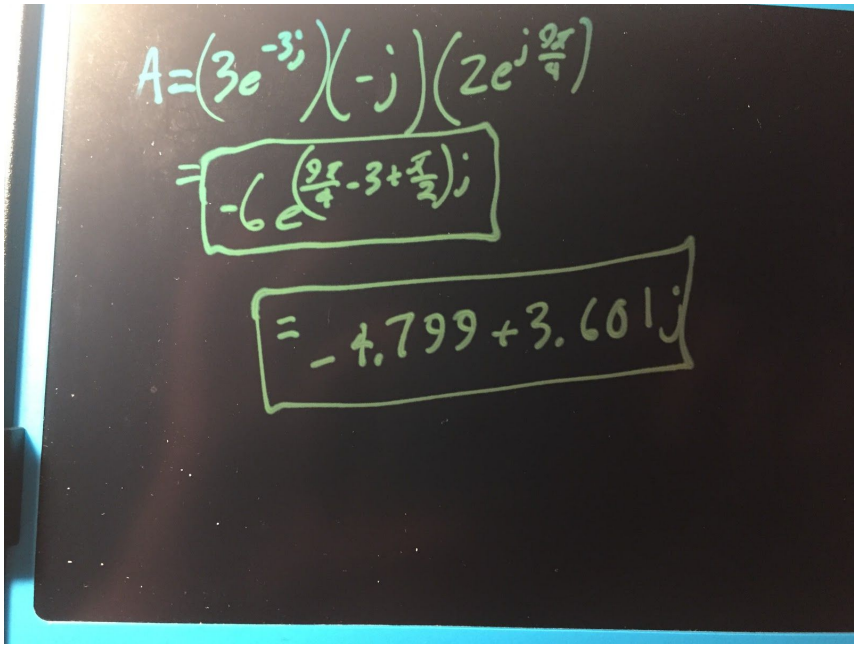
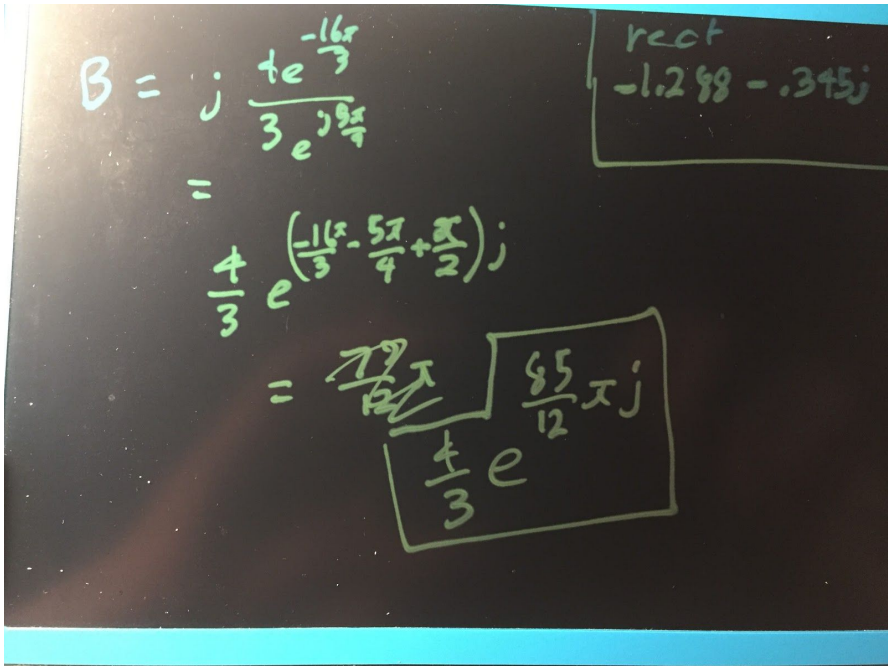
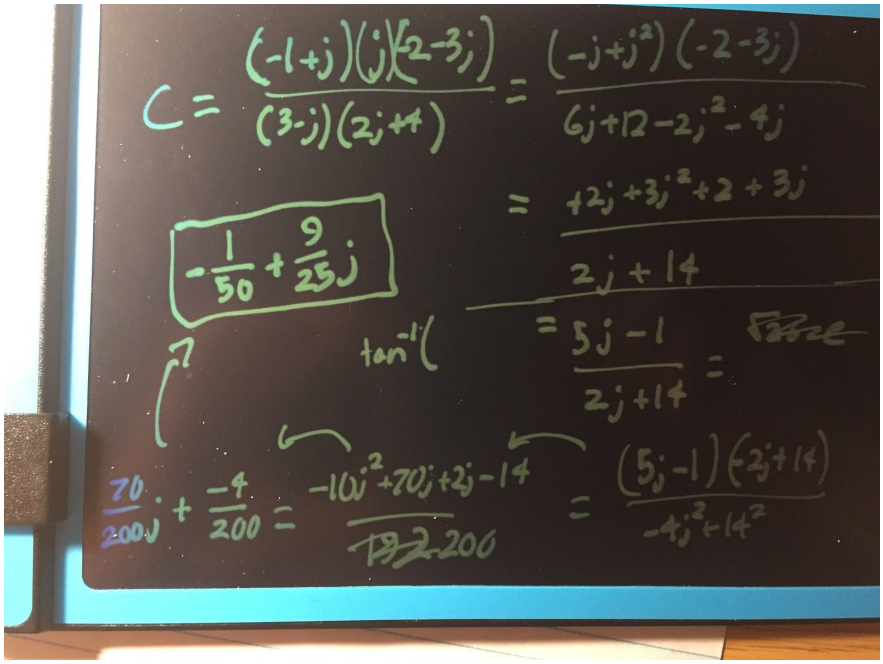
Category	Student Score	Grader Score
Organization		
Basics	1/1	/1
Structure	1/1	/1
Work		
Effort	2/2	/2
Clarity	1/2	/2
Discussion	2/2	/2
Correctness	1/2	/2
Total	**8/10**	**/10**

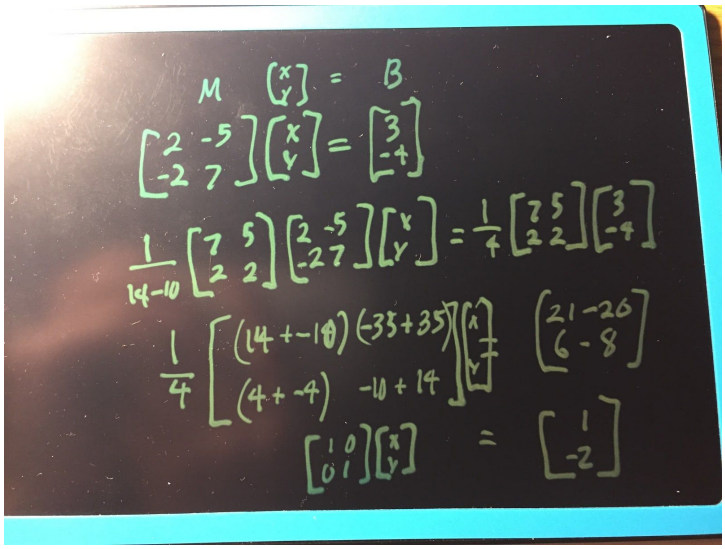
1- Euler Practice







2- Matrices



X = ¼

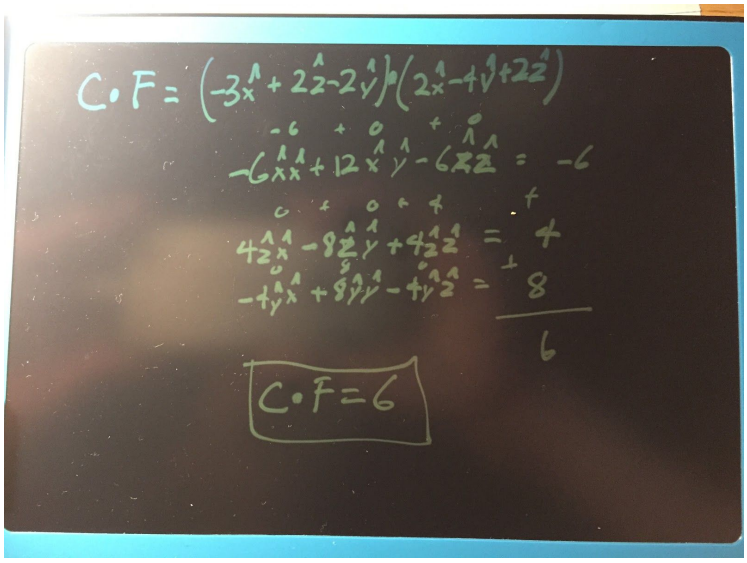
y= -½

```
disp([2,-5;-2,7]*[1/4;-1/2]);
```

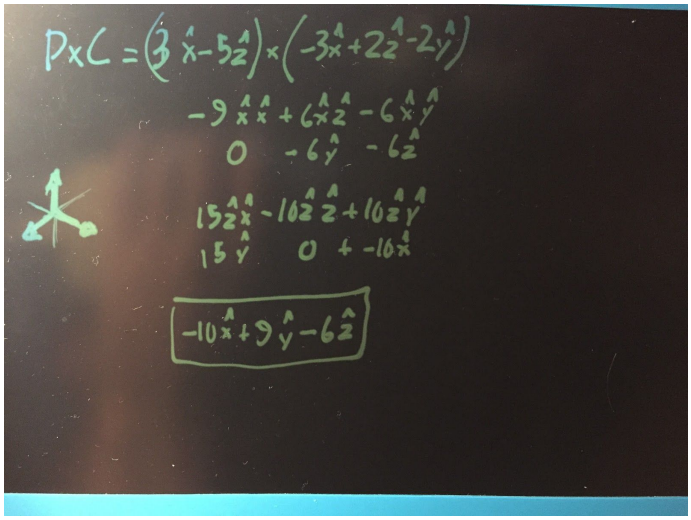
```
>> test
      3
     -4
```

3- VECTORS

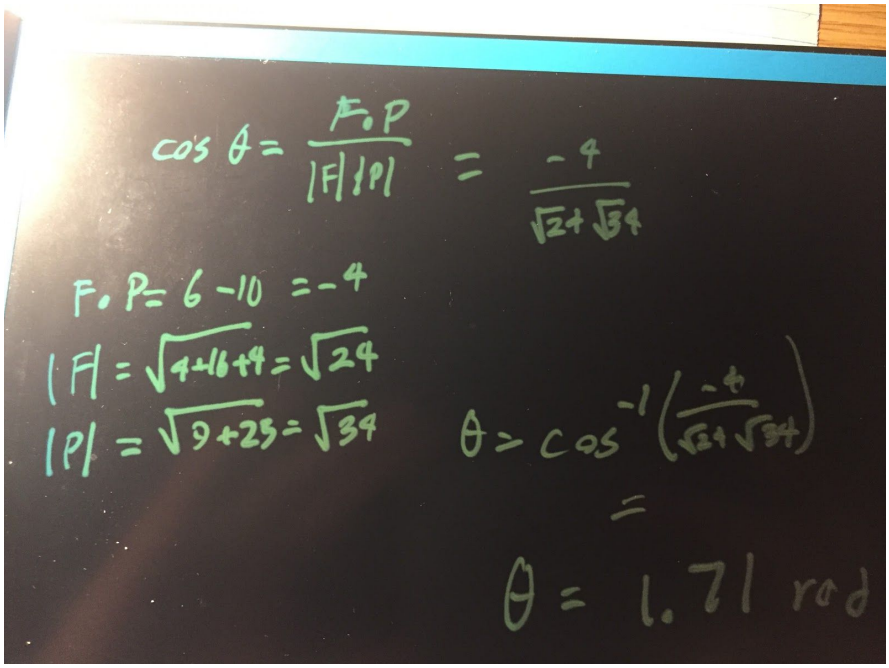
A



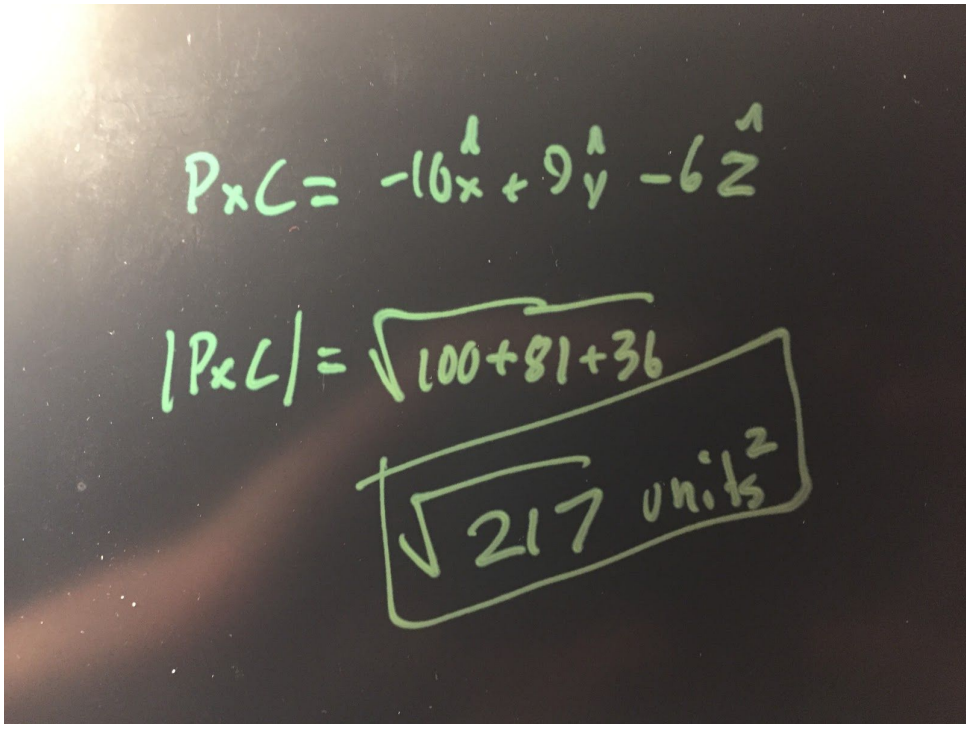
b)


$P \times C = (3\hat{x} - 5\hat{z}) \times (-3\hat{x} + 2\hat{z} - 2\hat{y})$
$-9\hat{x}\hat{x} + 6\hat{x}\hat{z} - 6\hat{x}\hat{y}$
$0 \quad -6\hat{y} \quad -6\hat{z}$
$15\hat{z}\hat{x} - 10\hat{z}\hat{z} + 10\hat{z}\hat{y}$
$15\hat{y} \quad 0 \quad -10\hat{x}$
$-10\hat{x} + 9\hat{y} - 6\hat{z}$

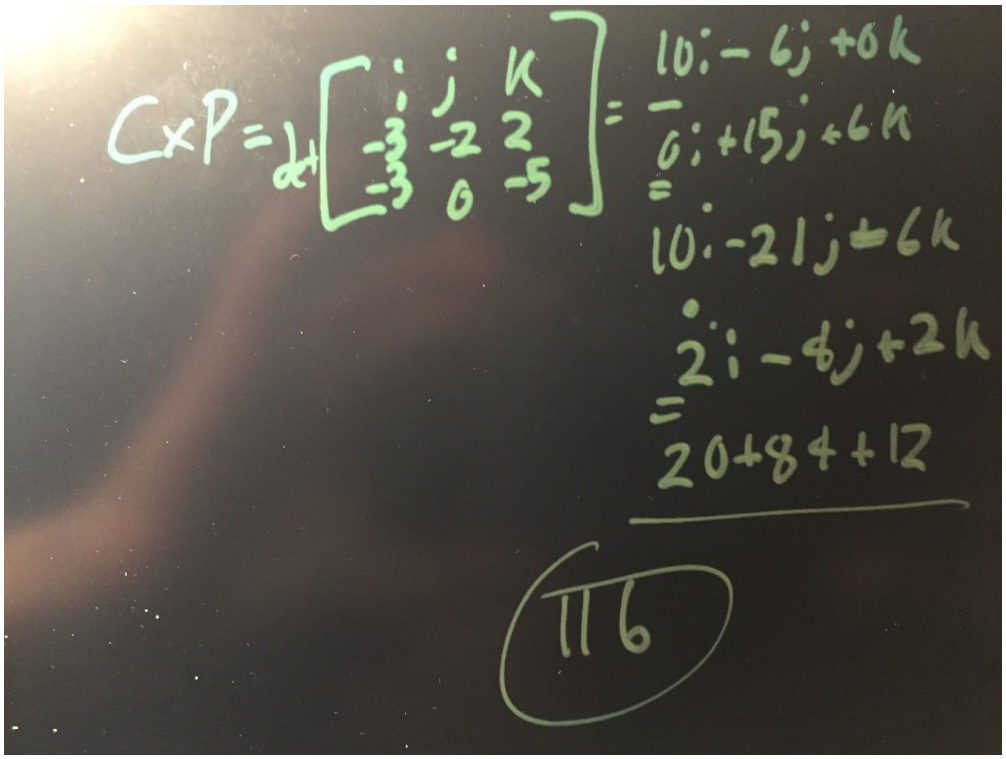
c)


$\cos\theta = \frac{F \cdot P}{|F||P|} = \frac{-4}{\sqrt{24}\sqrt{34}}$
$F \cdot P = 6 - 10 = -4$
$|F| = \sqrt{4+16+4} = \sqrt{24}$
$|P| = \sqrt{9+25} = \sqrt{34}$
$\theta = \cos^{-1}\left(\frac{-4}{\sqrt{24}\sqrt{34}}\right)$
$=$
$\theta = 1.71$ rad

d)

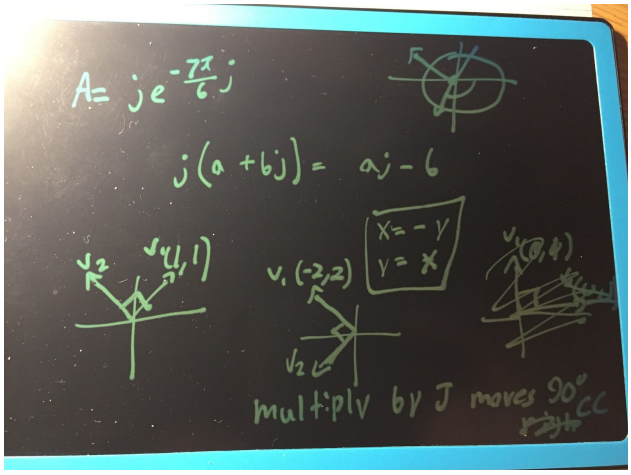

$P \times C = -16\hat{x} + 9\hat{y} - 6\hat{z}$
$|P \times C| = \sqrt{100+81+36}$
$\sqrt{217}$ units^2

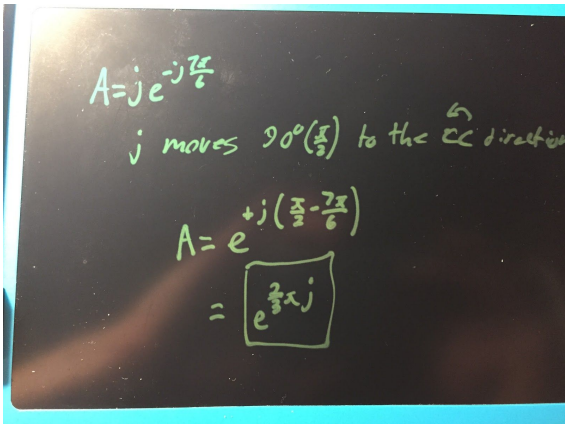
e)

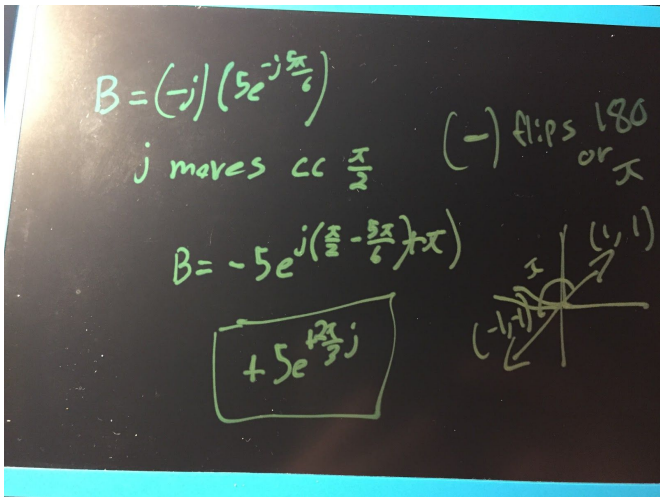

$C \times P = \det\begin{bmatrix} i & j & k \\ -3 & -2 & 2 \\ -3 & 0 & -5 \end{bmatrix}$
$10i - 6j + 0k$
$-$
$0i + 15j + 6k$
$=$
$10i - 21j + 6k$
$2i - 8j + 2k$
$=$
$20 + 84 + 12$
116

4- COMPLEX

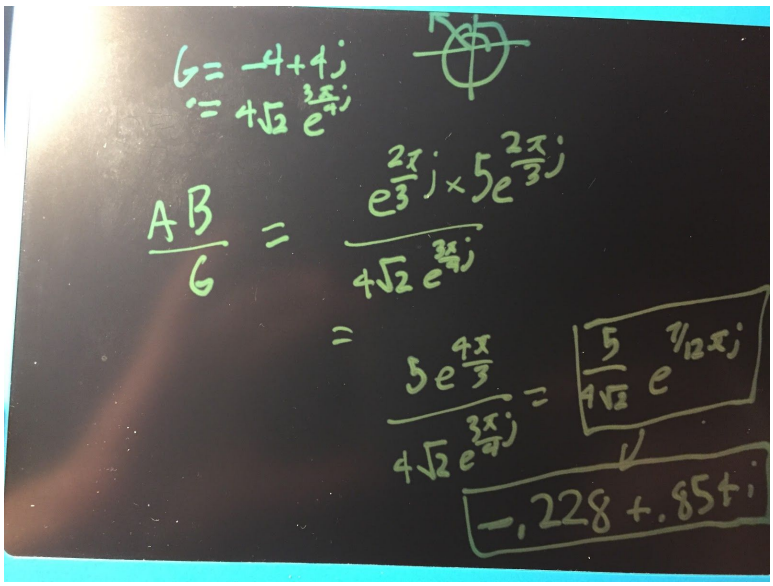
a) Represent A and B in the exponential form



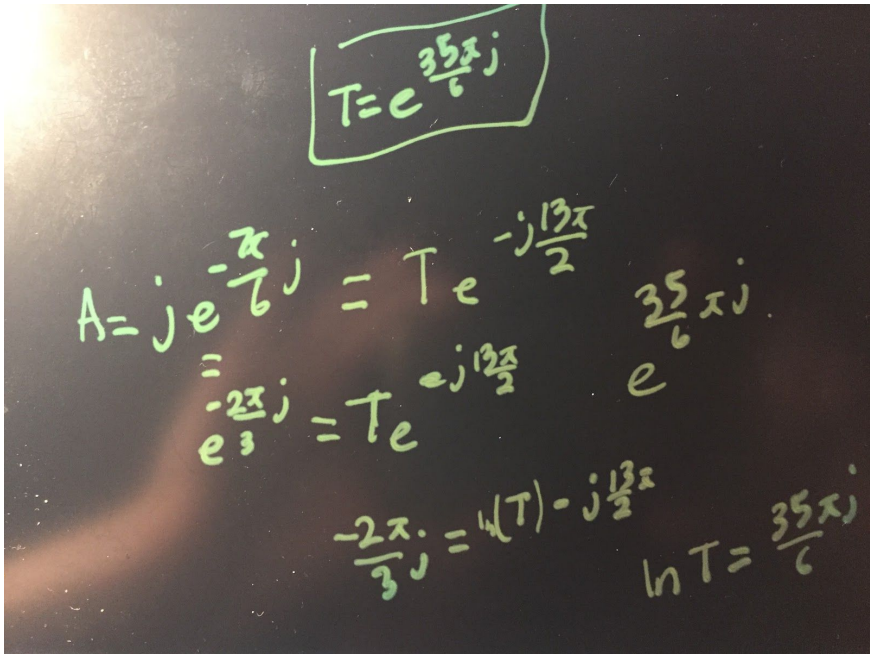




b) Find Q = AB/Gi in rectangular and exponential forms

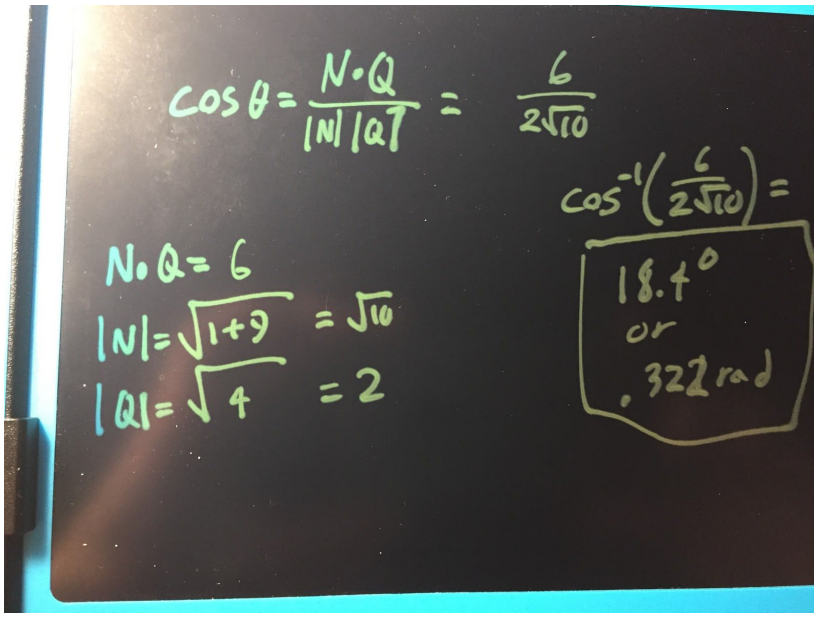


c) Find T so that A is equal to C

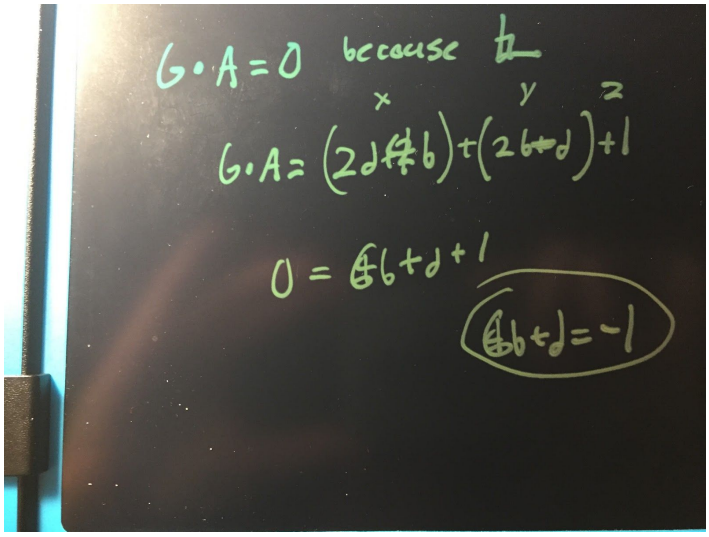

T=e^{35/6 πj}
A=je^{-π/6 j} = Te^{-j13π/2}
e^{-2π/3 j} = Te^{j13π/2}
e^{35/6 πj}
-2π/3 j = ln(T) - j13/2 π
ln T = 35/6 πj

5- Vectors

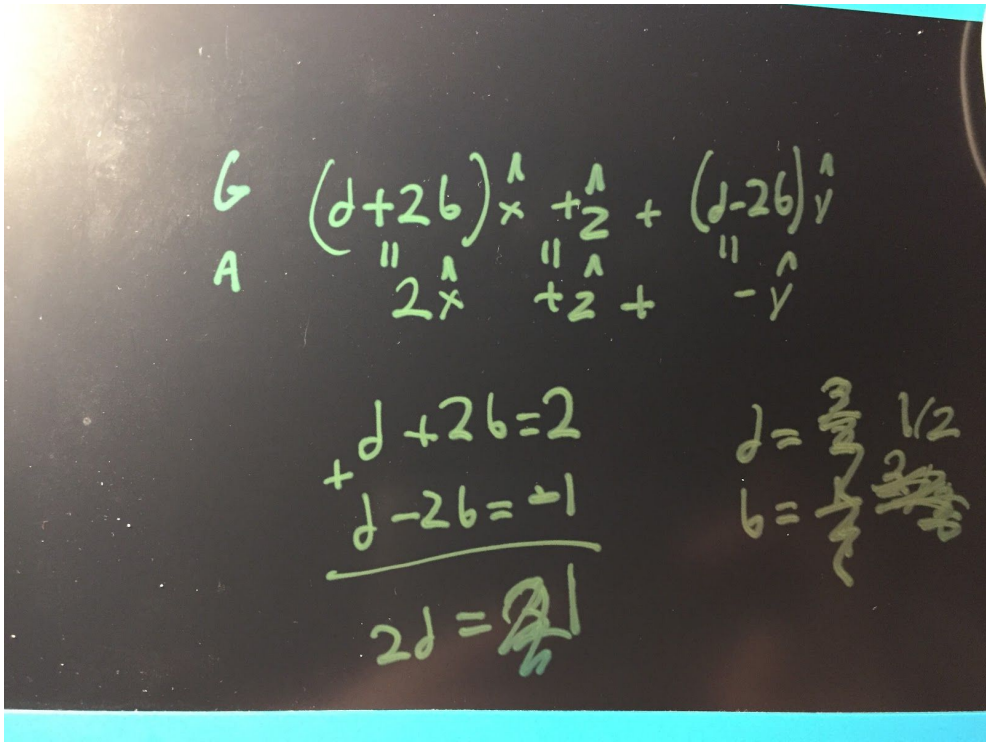
a)


cos θ = N·Q / |N||Q| = 6 / 2√10
cos^{-1}(6/2√10) =
N·Q = 6
|N| = √(1+9) = √10
|Q| = √4 = 2
18.4°
or
.321 rad

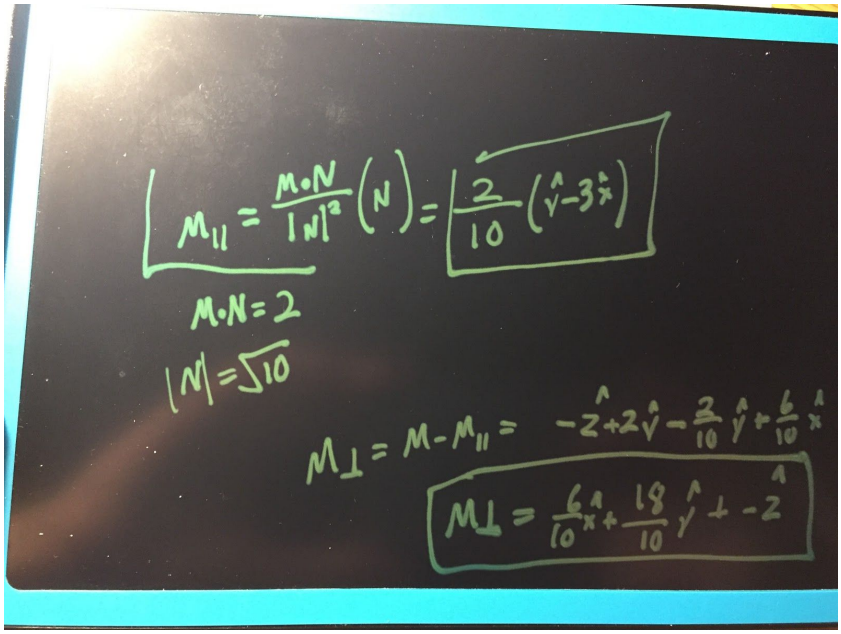
b)


G·A=0 because ⊥
x y z
G·A=(2d+6)+(2b+d)+1
0=6b+d+1
6b+d=-1

c)


G (d+2b)x̂ + ẑ + (d-2b)ŷ
A 2x̂ + ẑ + -ŷ
d+2b=2
+ d-2b=-1
2d=1
d=1/2
b=-1/4

d)


$M_{\parallel} = \frac{M \cdot N}{|N|^2}(N) = \frac{2}{10}(\hat{y} - 3\hat{x})$
$M \cdot N = 2$
$|N| = \sqrt{10}$
$M_{\perp} = M - M_{\parallel} = -\hat{z} + 2\hat{y} - \frac{2}{10}\hat{y} + \frac{6}{10}\hat{x}$
$M_{\perp} = \frac{6}{10}\hat{x} + \frac{18}{10}\hat{y} - \hat{z}$