**Complex Analysis**

***Visualization***

1. Consider $z=2+i$ and $w=-1+2i$. Draw the vectors $z, w, z+w, $and $z-w$



1. Consider $z=1+i$ and $w=-1+i$. Draw the vectors $z, w, z∙w,\frac{z}{w},\frac{1}{z}$, and $\overbar{z}$



1. Draw the following vectors: $z\_{1}=e^{\frac{i π}{2}}$, $z\_{2}=0.5e^{iπ}$, $z\_{3}=\sqrt{2}e^{\frac{-i π}{4}}$, and $z\_{4}=e^{\frac{i5 π}{4}}$



1. Describe in simple geometric terms what happens to a vector $z$ when:
	1. it is multiplied by $2$
	2. it is multiplied by $-1$
	3. it is multiplied by $i$
	4. it is squared
2. Consider the vector shown and draw the new vector(s) as indicated (the gray circle represents the unit circle)



 Find all four 4th roots (approx.) Find $z^{4}$



 Find all third roots of unity Find one sixth root