Calculos Informe Lab 4 (Quishpe Jhonatan- Flores Arévalo)

8.5.1 Transforme a su forma polar:

Proceso a seguir:

$$Z = Zx + Zy = R < \theta$$

$$R = \sqrt{Zx^2 + Zy^2}$$

$$\theta = tan^{-1}\left(\frac{Zy}{Zx}\right)$$

1) 2 + 3 j = $(\sqrt{2^2 + 3^2}) < \left(tan^{-1}\left(\frac{3}{2}\right)\right) = 3.61 < 56.31°$

2) -8 + 6.2 j =$(\sqrt{-8^2 + 6.2^2}) < \left(tan^{-1}\left(\frac{6.2}{-8}\right)\right) = 10.12 < -37.77°$

3) 4.3 – 2.8 j =$\left(\sqrt{4.3^2 + -2.8^2}\right) < \left(tan^{-1}\left(\frac{-2.8}{4.3}\right)\right) = 5.13 < -33.07°$

4) -6 – 3.2 j =$\left(\sqrt{-6^2 + -3.2^2}\right) < \left(tan^{-1}\left(\frac{-3.2}{-6}\right)\right) = 6.8 < 28.07°$

8.5.2 Transforme a su forma cartesiana:

Proceso a seguir:

$$Z = R < \theta = Zx + Zy$$

$$Zx = R * cos\ \theta$$

$$Zy = R * sin\ \theta * j$$

1) 36 < -10° = $36\cos(-10°) + 36\sin(-10°)\ j = 35.45 - 6.25\ j$

2) 28.7 < 135° = $28.7\cos(135°) + 28.7\sin(135°)\ j = -20.29 + 20.29j$

3) 11.2 < 28° = $11.2\cos(28°) + 11.2\sin(28°)\ j = 9.89 + 5.26j$

4) 45 < -117.9° = $45\cos(-117.9°) + 45\sin(-117.9°)\ j = -21.057 - 39.77j$

8.5.3. Realice las siguientes operaciones paso a paso, y represente el resultado tanto en su forma rectangular como en su forma polar.

1) $\frac{10+3j}{2j} - (7+2j) * (3 < -115°) =$

$\frac{10}{2j} + \frac{3j}{2j} - (7+2j) * (3\cos(155°) + 3\sin(115°)\ j) =$

$1.5 - 5j - (7+2j) * (-1.28 - 2.72j) =$

$1.5 - 5j - (-8.96 - 19.04j - 2.56j + 5.44) =$

$1.5 - 5j - (-3.52 - 21.6j) =$

$5.02 + 16.6j = \left(\sqrt{5.02^2 + 16.6^2}\right) < \left(tan^{-1}\left(\frac{16.6}{5.02}\right)\right) = 17.34 < 73.17$

2) $6.8 < 125.3° + \frac{4.5<-11.5°}{7.6-1.2j} =$

$6.8 < 125.3° + \frac{4.5 < -11.5°}{\left(\sqrt{7.6^2 + -1.2^2}\right) < \left(tan^{-1}\left(\frac{-1.2}{7.6}\right)\right)} =$

$6.8 < 125.3° + \frac{4.5 < -11.5°}{7.7 < -8.98°} =$

$6.8 < 125.3° + \frac{4.5}{7.7} < (-11.5 + 8.98)° =$

$6.8 < 125.3° + 0.58 < -2.52° =$

$6.458 < 121.2 = (6.458\cos(121.2°) + 6.458\sin(121.2°)\ j) = -3.345 + 5.524j$

3) $\frac{34+28.5j}{4<-20.8} - 51.2 < 215° = \frac{\left(\left(\sqrt{5.02^2+16.6^2}\right)<\left(tan^{-1}\left(\frac{16.6}{5.02}\right)\right)\right)}{4<-20.8} - 51.2 < 215° =$

$\frac{44.365 < 39.97°}{4 < -20.8} - 51.2 < 215° =$

$\left(\frac{44.365}{4} < (39.97 - (-20.8))°\right) - 51.2 < 215° =$

$11.09 < 60.77° - 51.2 < 215° =$

$61.38 < 39.506° = (61.38\cos(39.506°) + 61.38\sin(39.506°)\ j) = 47.36 + 39.04j$