Tranformar a la forma polar

$a)\ 2 + j3$

$$C = \sqrt{A^2 + B^2} = \sqrt{2^2 + 3^2} = \sqrt{13}$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{3}{2}\right) = 56.31°$$
$$Respuesta \rightarrow \sqrt{13} < 56.31°$$

$b)\ -8 + j6.2$

$$C = \sqrt{A^2 + B^2} = \sqrt{(-8)^2 + 6.2^2} = 10.12$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{6.2}{-8}\right) = -37.77°$$
$$Respuesta \rightarrow 10.12 < -37.77°$$

$c)\ 4.3 - j2.8$

$$C = \sqrt{A^2 + B^2} = \sqrt{4.3^2 + 2.8^2} = 5.13$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{2.8}{4.3}\right) = 33.07°$$
$$Respuesta \rightarrow 5.13 < 33.07°$$

$d)\ -6 - j3.2$

$$C = \sqrt{A^2 + B^2} = \sqrt{(-6)^2 + (-3.2)^2} = 6.8$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{-3.2}{-6}\right) = 28.07°$$
$$Respuesta \rightarrow 6.8 < 28.07°$$

Tranformar a la forma rectangular

$a)\ 36 < -10°$

$$A = Ccos(\theta) = 36\cos(-10) = 35.45$$
$$B = Csen(\theta) = 36\,\text{sen}(-10) = -6.25$$
$$Respuesta \rightarrow 35.45 - j6.25$$

$b)\ 28.7 < 135°$

$$A = Ccos(\theta) = 28.7\cos(135) = -20.29$$
$$B = Csen(\theta) = 28.7\,\text{sen}(135) = 20.29$$
$$Respuesta \rightarrow -20.29 + j20.29$$

$c)\ 11.2 < 28°$

$$A = Ccos(\theta) = 11.2\cos(28) = 9.88$$
$$B = Csen(\theta) = 11.2\,\text{sen}(28) = 5.25$$

$$Respuesta \rightarrow 9.88 + j5.25$$

$$d)\ 45 < -117.9°$$

$$A = Ccos(\theta) = 45\cos(-117.9) = -21.05$$
$$B = Csen(\theta) = 45\,\text{sen}(-117.9) = -39.76$$
$$Respuesta \rightarrow -21.05 - j39.76$$

Tranformar a la forma rectangular y polar

$$a)\ 10 + j3 - (7 + j2)(3 < -115°) - 2j$$

$$C = \sqrt{A^2 + B^2} = \sqrt{7^2 + 2^2} = 7.28$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{2}{7}\right) = 15.94°$$
$$Respuesta \rightarrow 7.28 < 15.94°$$

$$(7.28 < 15.94°)(3 < -115°) = 21.84 < -99.06°$$

$$*\ 21.84 < -99.06°\ a\ rectangular$$

$$A = Ccos(\theta) = 21.84\cos(-99.06) = -3.44$$
$$B = Csen(\theta) = 21.84\,\text{sen}(-99.06) = -21.57$$
$$Respuesta \rightarrow -3.44 - j21.57$$

$$10 + j3 + 3.44 + j21.57 - 2j = 0$$

$$\boldsymbol{Respuesta \rightarrow 13.44 + j22.57}$$

$$*\ 13.44 + j22.57\ a\ polar$$

$$C = \sqrt{A^2 + B^2} = \sqrt{13.44^2 + 22.57^2} = 26.26$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{22.57}{13.44}\right) = 59.22°$$

$$\boldsymbol{Respuesta \rightarrow 26.26 < 59.22°}$$

$$b)\ 6.8 < 125.3° + \frac{4.5 < -11.5°}{7.6 - j1.2}$$

$$*\ 7.6 - j1.2\ a\ polar$$

$$C = \sqrt{A^2 + B^2} = \sqrt{7.6^2 + (-1.2)^2} = 7.69$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{-1.2}{7.6}\right) = -8.97°$$
$$Respuesta \rightarrow 7.69 < -8.97°$$
$$6.8 < 125.3° + \frac{4.5 < -11.5°}{7.69 < -8.97°}$$

$$\frac{4.5 < -11.5°}{7.69 < -8.97°} = \frac{4.5}{7.69} < -11.5 + 8.97°$$
$$Respuesta \rightarrow 0.58 < -2.53°$$

$$* (6.8 < 125.3°) + (0.58 < -2.53°)\ a\ rectangular$$

$$A = Ccos(\theta) = 6.8\cos(125.3) = -3.92$$
$$B = Csen(\theta) = 6.8\,\text{sen}(125.3) = 5.54$$
$$Respuesta \rightarrow\ -3.92 + j5.54$$

$$A = Ccos(\theta) = 0.58\cos(-2.53) = 0.57$$
$$B = Csen(\theta) = 0.58\,\text{sen}(-2.53) = -0.02$$
$$Respuesta \rightarrow\ 0.57 - j0.02$$

$$(-3.92 + j5.54) + (0.57 - j0.02)$$

$$\boldsymbol{Respuesta \rightarrow -3.35 + j5.52}$$

$$*\ -3.35 + j5.52\ a\ polar$$

$$C = \sqrt{A^2 + B^2} = \sqrt{(-3.35)^2 + 5.52^2} = 6.45$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{5.52}{-3.35}\right) = -58.74°$$

$$\boldsymbol{Respuesta \rightarrow\ 6.45 < -58.74°}$$

$$c)\ \frac{34 + j28.6}{4 < -20.8°} - 51.2 < 215°$$

$$* 34 + j28.6\ a\ polar$$

$$C = \sqrt{A^2 + B^2} = \sqrt{34^2 + 28.6^2} = 44.43$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{28.6}{34}\right) = 40.07°$$
$$Respuesta \rightarrow\ 44.43 < 40.07°$$

$$\frac{44.42 < 40.06°}{4 < -20.8°} = \frac{44.43}{4} < 40.06° + 20.8°$$
$$Respuesta \rightarrow 11.10 < 60.87°$$

$$* (11.10 < 60.87°\ ) - (51.2 < 215°)\ a\ rectangular$$

$$A = Ccos(\theta) = 11.10\cos(60.87) = 5.40$$
$$B = Csen(\theta) = 11.10sen(60.87) = 9.70$$
$$Respuesta \rightarrow\ 5.4 + j9.70$$

$$A = Ccos(\theta) = 51.2\cos(215) = -41.94$$
$$B = Csen(\theta) = 51.2\,\text{sen}(215) = -29.36$$
$$Respuesta \rightarrow \ -41.94 - j29.36$$

$$(5.4 + j9.70) - (-41.94 - j29.36)$$

$$\boldsymbol{Respuesta \rightarrow 47.34 + j39.06}$$

$$*\ 47.34 + j39.06\ a\ polar$$

$$C = \sqrt{A^2 + B^2} = \sqrt{47.34^2 + 39.06^2} = 61.37$$
$$\theta = \tan^{-1}\left(\frac{B}{A}\right) = \tan^{-1}\left(\frac{39.06}{47.34}\right) = 39.52°$$

$$\boldsymbol{Respuesta \rightarrow \ 61.37 < 39.52°}$$

Fórmulas usadas para los cálculos:

$$*\ Forma\ Rectangular\ a\ Polar$$

$$A \pm jB$$

$$C = \sqrt{A^2 + B^2}$$

$$\theta = \tan^{-1}\left(\frac{B}{A}\right)$$

$$C < \theta$$

$$*\ Forma\ Polar\ a\ Rectangular$$

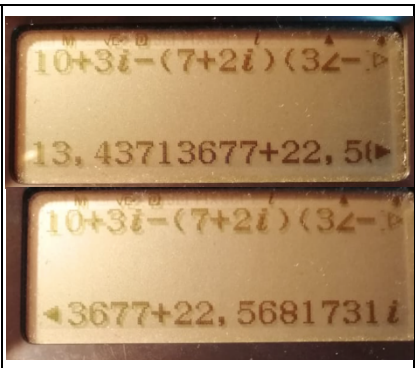
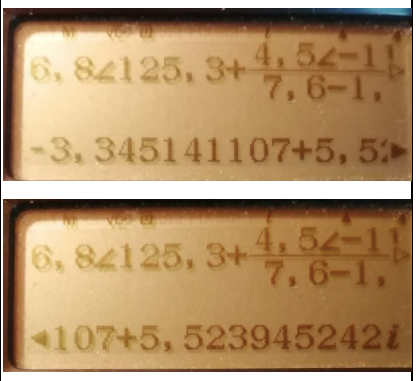
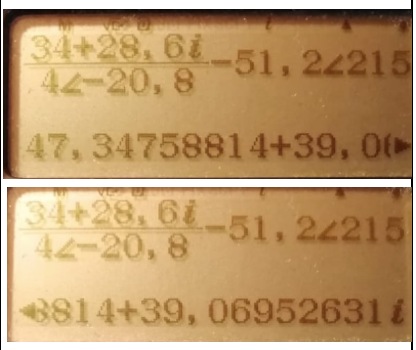
$$C < \theta$$

$$A = C\cos(\theta)$$

$$B = C\ sen(\theta)$$

$$A \pm jB$$

- Resuelva las operaciones anteriores por medio de la calculadora y compare resultados.

$a)\ 10 + j3 - (7 + j2)(3 < -115°) - 2j$	$\boldsymbol{Respuesta \rightarrow 13.44 + j22.57}$	
$b)\ 6.8 < 125.3° + \frac{4.5 < -11.5°}{7.6 - j1.2}$	$\boldsymbol{Respuesta \rightarrow -3.35 + j5.52}$	
$c)\ \frac{34 + j28.6}{4 < -20.8°} - 51.2 < 215°$	$\boldsymbol{Respuesta \rightarrow 47.34 + j39.06}$	

- ***Los resultados obtenidos tanto para el literal a,b y c se asemejan a lo que sale en la calculadora, ya que al realizar los pasos uno por uno los decimales no se los toma en cuenta y la calculadora lo que hace es tomar todos los decimales de los cálculos y mostrar el resultado completo.***