



PROBLEM:

Convert the following to polar form:

(a) $z = j10$

(b) $z = -10$

(c) $z = (-10, -10)$

(d) $z = -2 + j2$

(e) $z = -3 + j\sqrt{3}$

(f) $z = 20$

Give numerical values for the magnitude, and the angle (or phase) in radians.

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SOLUTION



<u>RECTANGULAR</u>	<u>POLAR</u>	
a) $j10$	$10e^{j\frac{\pi}{2}}$	
b) -10	$-10e^{j0}$ $+10e^{j\pi}$	
c) $-10-j10$	$\sqrt{(-10)^2 + (-10)^2} \cdot \text{TAN}^{-1}\left(\frac{\text{Im} = -10}{\text{Re} = -10}\right)$ $10\sqrt{2} e^{-j\frac{3}{4}\pi}$	BE AWARE OF POSSIBLE CONFUSION BETWEEN 1ST + 3RD QUADRANT SOLUTIONS
d) $-2+j2$	$\sqrt{8} e^{j\frac{3}{4}\pi}$ 	
e) $-3+j\sqrt{3}$	$\sqrt{12} e^{j(150^\circ = \frac{5}{6}\pi \text{ rad})}$	
f) 20	$20e^{j0} = 20$	