Rectangular and Polar Forms of Complex Numbers- Guided Lesson Explanation

Explanation#1

There are known formulas as you will see below for converting x and y to polar forms

$r = \sqrt{x^2+y^2}$ (To find r.)

$r = \sqrt{3^2+7^2}$

$r = \sqrt{9+49}$

$r = \sqrt{58}$

$r = 7.61$

$\theta = \tan^{-1} = \dfrac{y}{x}$ (To find θ.)

$\tan^{-1} = \dfrac{7}{3}$

$\tan^{-1} = 2.33$

$\tan^{-1} = 66.77$

Explanation#2

We follow the same series of procedures as in number one. Since we are converting from rectangular to polar forms again.

$$r = \sqrt{x^2+y^2}$$

$$r = \sqrt{2^2+5^2}$$

$$r = \sqrt{4+25}$$

$$r = \sqrt{29}$$

$$r = 5.38$$

$$\theta = \tan^{-1} = \frac{y}{x}$$

$$\tan^{-1} = \frac{5}{2}$$

$$\tan^{-1} = 2.5$$

$$\tan^{-1} = 68.19$$

Explanation#3

The known formulas for converting from polar to rectangular form are:

x = r cosθ and   y = r sin θ

r = the distance from the origin

θ = angle relative to the Zero axis

Now we plug our numbers into this equation:

x = 4 cos75°   y = 4 sin 75°

x = 4 x 0.25   y = 4 x 0.96

x = 1   y = 3.84

Rectangular form = (1, 3.84)