

15-2

Writing Equations in Rectangular Form

$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$\boxed{r^2 = x^2 + y^2} \quad \tan \theta = \frac{y}{x}$$

#1) $r = 7$

↑
What
shape?

$r = 7$

$$r^2 = 7^2 \quad (\text{no } r \text{ by itself in main 4 rules})$$

$$x^2 + y^2 = 49 \rightarrow \text{circle}$$

#2) $\theta = \frac{\pi}{6}$

↑
What
shape?

$\theta = \frac{\pi}{6}$

$$\tan \theta = \tan \frac{\pi}{6} \quad (\text{no } \theta \text{ by itself in main 4 rules})$$

$\frac{y}{x} = \frac{\sqrt{3}}{3}$

$y = \frac{\sqrt{3}}{3}x \rightarrow \text{line}$

#3) $r = -5 \sin \theta$

$r = -5 \sin \theta$

$$r \cdot r = -5 \sin \theta \cdot r \quad (\text{WAY easier than squaring - first rule})$$

$r^2 = -5r \sin \theta$

$x^2 + y^2 = -5y$

$x^2 + y^2 + 5y = 0$ ← remember this?

$x^2 + (y^2 + 5y + 6.25) = 6.25$

$x^2 + (y + 2.5)^2 = 6.25 \rightarrow \text{circle}$

#4) $r = \frac{9}{\cos \theta + \sin \theta}$

$r = \frac{9}{\cos \theta + \sin \theta}$

$r \cdot \frac{1}{r} = \frac{9}{\cos \theta + \sin \theta} \cdot \frac{1}{r}$

$1 = \frac{9}{r \cos \theta + r \sin \theta}$

$r \cos \theta + r \sin \theta = 9$

$x + y = 9$

$y = -x + 9 \rightarrow \text{line}$

CW/HW - Worksheet 8.4

When this is a summary skill / today