

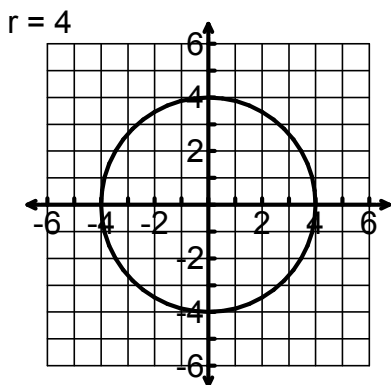
## Common Polar Curves

p. 555 - 556 (10.3)

# 38a

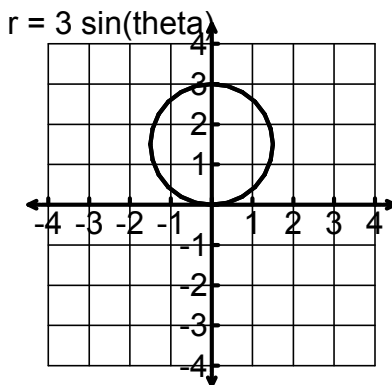
**Circles**  $r = \text{constant}$

$$0 \leq \theta \leq 2\pi$$



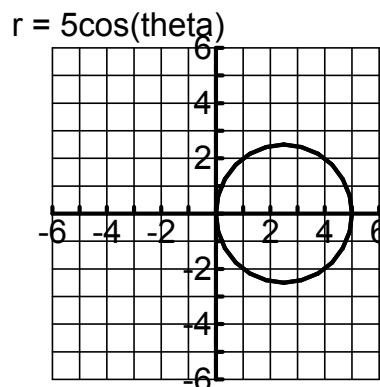
$$r = a \sin(\theta)$$

$$0 \leq \theta \leq \pi$$



$$r = a \cos(\theta)$$

$$0 \leq \theta \leq \pi$$



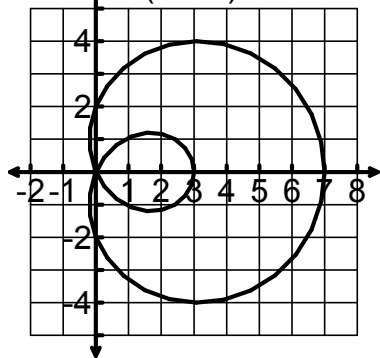
**Limacons**  $r = a \pm b \sin(\theta)$  OR  $r = a \pm b \cos(\theta)$  both for  $a > 0$  &  $b > 0$

$$\frac{a}{b} < 1 \text{ for } 0 \leq \theta \leq 2\pi$$

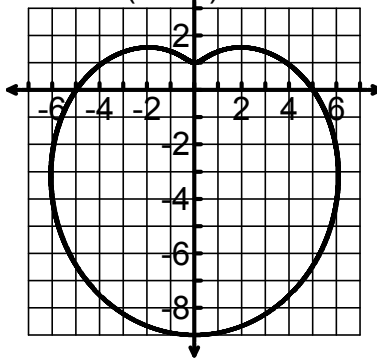
$$1 < \frac{a}{b} < 2 \text{ for } 0 \leq \theta \leq \pi$$

$$\frac{a}{b} = 1 \text{ for } 0 \leq \theta \leq 2\pi$$

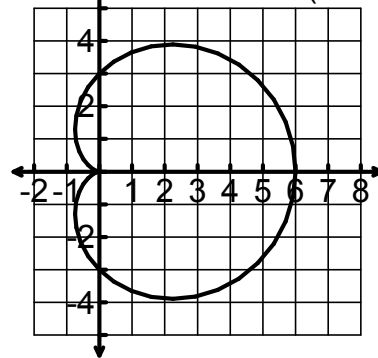
$r = 2 + 5 \cos(\theta)$



$r = 5 - 4 \sin(\theta)$



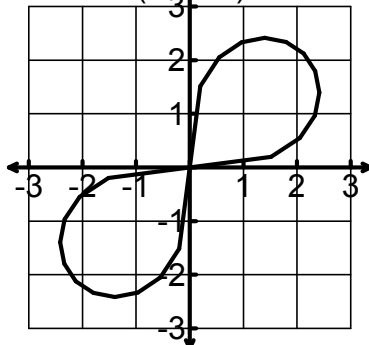
**Cardioid**  $r = 3 + 3 \cos(\theta)$



**Lemniscates**  $r^2 = a^2 \sin(2\theta)$  for  $0 \leq \theta \leq \pi$

$r^2 = a^2 \cos(2\theta)$  for  $0 \leq \theta \leq \pi$

$r^2 = 9 \sin(2\theta)$



$r^2 = 9 \cos(2\theta)$

