

$$7. \quad r = 2 + 2 \sin \theta$$

CARDIOID

SYMMETRY

X-AXIS

$$r = 2 + 2 \sin(-\theta)$$

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

NOT
SYMMETRIC

TO

X-AXIS

Y-AXIS

$$r = 2 + 2 \sin(\pi - \theta)$$

$$r = 2 + 2 [\sin \pi \cos \theta - \cos \pi \sin \theta]$$

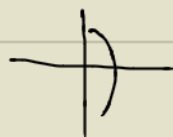
$$r = 2 + 2 [-(-1) \sin \theta]$$

$$r = 2 + 2 \sin \theta \quad \checkmark$$

SYMMETRIC TO Y-AXIS

ORIGIN

DOES NOT
WORK



$$r = 2 + 2 \sin \theta$$

θ	r
0	$2 + 2 \sin 0 = 2$
$\frac{\pi}{6}$	$2 + 2 \sin \frac{\pi}{6} = 3$
$\frac{\pi}{4}$	$2 + 2 \sin \frac{\pi}{4} = 3.4$
$\frac{\pi}{3}$	$2 + 2 \sin \frac{\pi}{3} = 3.7$
$\frac{\pi}{2}$	$2 + 2 \sin \frac{\pi}{2} = 4$
$\frac{3\pi}{2}$	$2 + 2 \sin \frac{3\pi}{2} = 0$
$\frac{5\pi}{3}$	$2 + 2 \sin \frac{5\pi}{3} = 0.3$
$\frac{7\pi}{4}$	$2 + 2 \sin \frac{7\pi}{4} = 0.6$
$\frac{11\pi}{6}$	$2 + 2 \sin \frac{11\pi}{6} = 1$

