

Section 8.2: 1-10, 17, 19, 21, 23, 25, 29, 31, 35; p. 553

1) To plot points in Polar coordinates, we use a grid consisting of circles centered at the pole and rays emanating from the pole

2) To graph $r=f(\theta)$, plot all the points (r, θ) that satisfy the Eq.
 with radius = 3

b) The graph of $r=3$ is a circle centered at the pole.

The graph of the Polar Equation $\theta = \frac{\pi}{4}$ is a line passing through the pole with a slope of 1

Graphs on next page.

3) VI 4) III 5) II 6) IV 7) I 8) V

9) $r = 2 - \sin \theta$ • not symmetric to the Polar-axis
 $2 - \sin \frac{\pi}{6} \neq 2 - \sin \frac{\pi}{6}$
• not symmetric about the pole
 $-r \neq r$
• symmetric about $\theta = \frac{\pi}{2}$
 $2 - \sin(\frac{\pi}{2} - \frac{\pi}{6}) = 2 - \sin(\frac{\pi}{6})$

10) $r = 4 + 8 \cos \theta$ is symmetric to the polar axis.

17) $r = 2$ see graphs $r^2 = 4 \rightarrow x^2 + y^2 = 4$

19) $\theta = -\frac{\pi}{2}$ see graphs  $x=0, y=-1$

21) $r = 6 \sin \theta$ " $r^2 = 6r \sin \theta \rightarrow x^2 + y^2 = 6y$
 $x^2 + (y-3)^2 = 9$

$$23) r = -2 \cos \theta$$

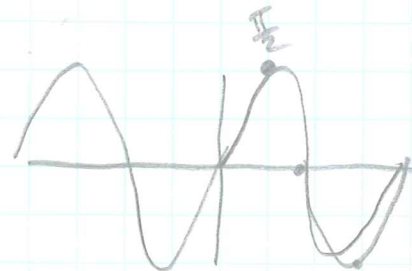
θ	r
0	-2
$+\pi/6$	$-\sqrt{3} = -1.7$
$-\pi/6$	-1.7
$\pm\pi/4$	$-\sqrt{2} = -1.4$
$\pm\pi/3$	-1
$\pm\pi/2$	0

$$25) r = 2 - 2 \cos \theta$$

θ	r
0	0
$\pm\pi/6$	$2 - 1.7 = 0.3$
$\pm\pi/4$	$2 - 1.4 = 0.6$
$\pm\pi/3$	$2 - 1 = 1$
$\pm\pi/2$	$2 - 0 = 2$

$$29) r = 2 \sin \theta$$

θ	r
0	0
$\pi/6$	$2 \cdot 1 = 1$
$\pi/4$	$2 \cdot \frac{\sqrt{2}}{2} = \sqrt{2} = 1.4$
$\pi/3$	$2 \cdot \frac{\sqrt{3}}{2} = \sqrt{3}$
$\pi/2$	$2 \cdot 1 = 2$



$$31) r = -\cos 5\theta$$

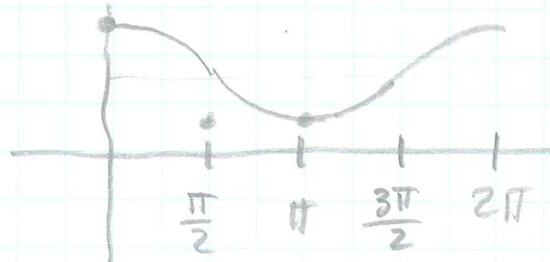
$$\text{per} = \frac{2\pi}{5}$$

θ	r
0	-1
$180^\circ \pi/10$	0
$360^\circ \pi/5$	+1
$540^\circ 3\pi/10$	0
$720^\circ 2\pi/5$	-1

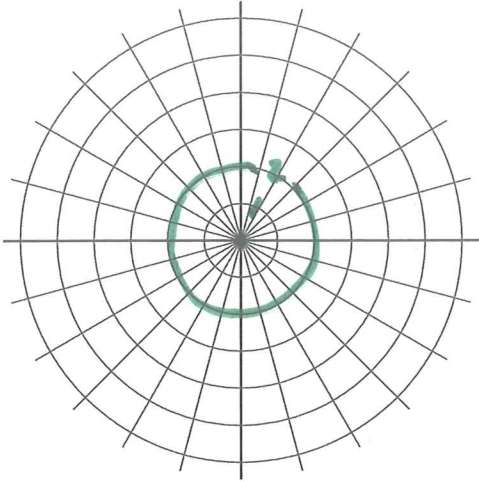


$$35) r = \sqrt{3} + \cos \theta$$

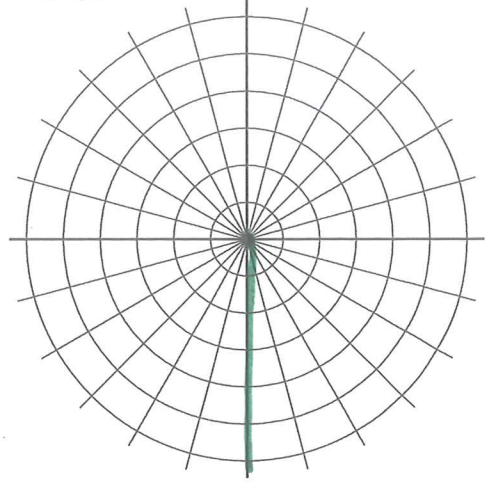
θ	r
$2\pi, 0$	$\sqrt{3} + 1 = 2.7$
$\pm\pi/2$	$\sqrt{3} + 0 = 1.7$
$\pm 3\pi/2$	$\sqrt{3} + 0 = 1.7$
$\pm\pi$	$\sqrt{3} - 1 = 0.7$
$\pm\pi/4$	$\sqrt{3} + \frac{\sqrt{2}}{2} = 1.7 + .7 = 2.4$
$\pm 3\pi/4$	$\sqrt{3} - \frac{\sqrt{2}}{2} = 1.7 - .7 = 1$



17)

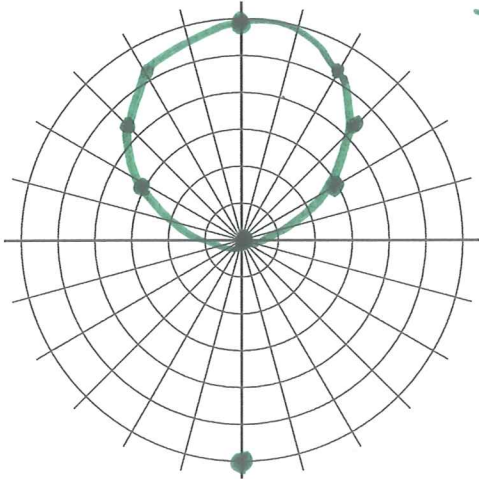


19)



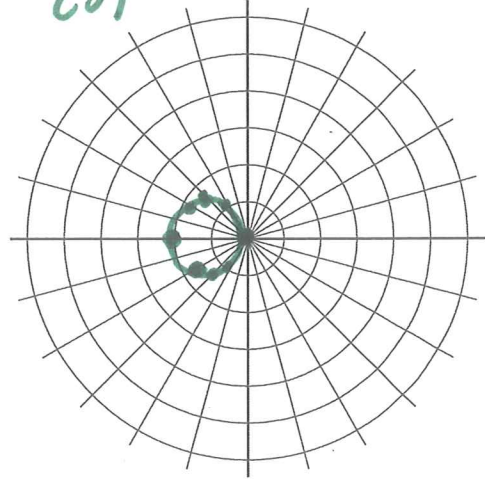
$r = 6 \sin \theta$

21)

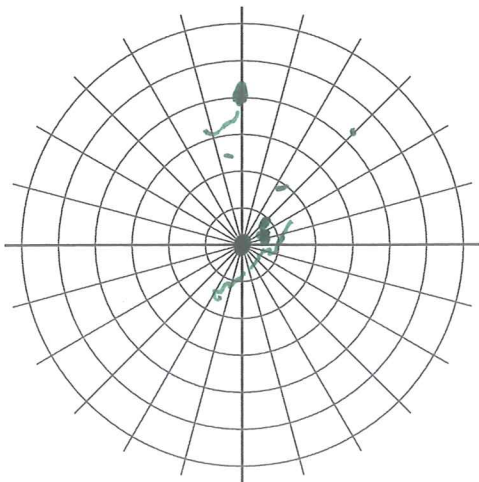


θ	r
0	0
$\frac{\pi}{6}$	3
$\frac{\pi}{4}$	4.2
$\frac{\pi}{3}$	5.2
$\frac{\pi}{2}$	6

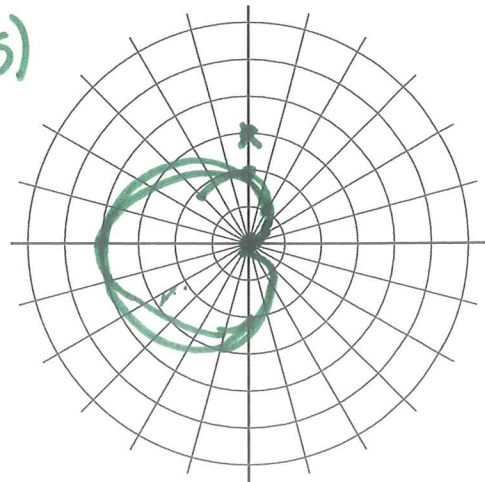
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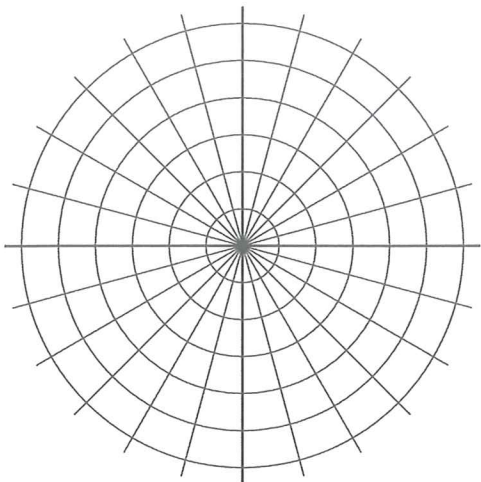
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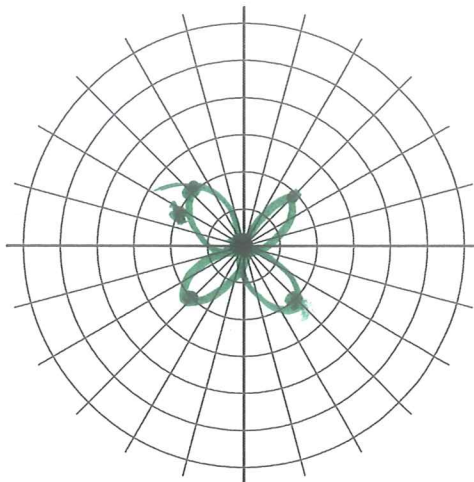
25)



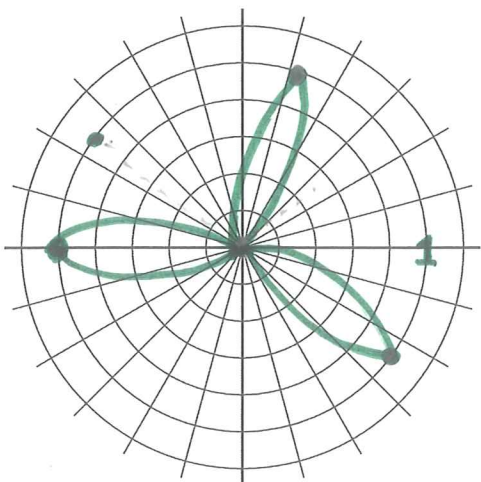
27)



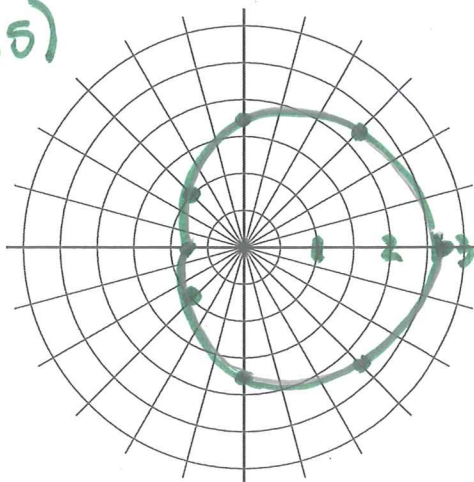
29)



30)



35)



31)

