

HW #64 p.557

1. $(\sqrt{2}, \sqrt{2})$ or $(1.4, 1.4)$

3. $(-\frac{5}{2}, -\frac{5\sqrt{3}}{2})$ or $(-2.5, -4.3)$

26. $x = -2$ vertical line

$$\frac{r \cos \theta}{\cos \theta} = \frac{-2}{\cos \theta}$$

$$\boxed{r = -2 \sec \theta}$$

27. $(x+5)^2 + y^2 = 25$

$$(r \cos \theta + 5)^2 + (r \sin \theta)^2 = 25$$

$$r^2 \cos^2 \theta + 10r \cos \theta + 25 + r^2 \sin^2 \theta = 25$$

$$r^2 (\cos^2 \theta + \sin^2 \theta) + 10r \cos \theta = 0$$

$$r^2 + 10r \cos \theta = 0$$

$$r \neq 0 \quad r + 10 \cos \theta = 0$$

$$r(r + 10 \cos \theta) = 0$$

$$\boxed{r = -10 \cos \theta}$$

28. $y = -3$ horizontal line

$$\frac{r \sin \theta}{\sin \theta} = \frac{-3}{\sin \theta}$$

$$\boxed{r = -3 \csc \theta}$$

$$r = -3 \cdot \frac{1}{\sin \theta}$$

$$29. x = y^2$$

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

$$\frac{r \cos \theta}{r} = \frac{r^2 \sin^2 \theta}{r}$$

$$\frac{\cos \theta}{\sin^2 \theta} = \frac{r \sin^2 \theta}{\sin^2 \theta}$$

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

$$r = \cot \theta \cdot \csc \theta$$

$$30. (x-2)^2 + y^2 = 4$$

$$(r \cos \theta - 2)^2 + (r \sin \theta)^2 = 4$$

$$r^2 \cos^2 \theta - 4r \cos \theta + 4 + r^2 \sin^2 \theta = 4$$

$$r^2 (\cos^2 \theta + \sin^2 \theta) - 4r \cos \theta = 0$$

$$r^2 - 4r \cos \theta = 0$$

$$r(r - 4 \cos \theta) = 0$$

$$r = 0 \quad r - 4 \cos \theta = 0$$

$$r = 4 \cos \theta$$

$$31. (x-1)^2 - y^2 = 1$$

$$(r \cos \theta - 1)^2 - (r \sin \theta)^2 = 1$$

$$r^2 \cos^2 \theta - 2r \cos \theta + 1 - r^2 \sin^2 \theta = 1$$

$$-r^2 (1 - \cos^2 \theta) = 1$$

$$r^2 \cos^2 \theta - 2r \cos \theta - r^2 + r^2 \cos^2 \theta = 0$$

$$2r^2 \cos^2 \theta - 2r \cos \theta - r^2 = 0$$

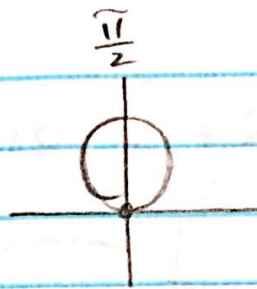
$$2r \cos^2 \theta - 2 \cos \theta - r = 0$$

$$36. \quad r = 3 \sin \theta$$

$$r^2 = 3r \sin \theta$$

$$x^2 + y^2 = 3y$$

$$x^2 + y^2 - 3y = 0 \quad \text{circle}$$



$$37. \quad \theta = -\frac{\pi}{3}$$

$$\frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{-\frac{\sqrt{3}}{2} \cdot \frac{2}{1}}{1} = -\sqrt{3}$$

$$\tan \theta = \tan -\frac{\pi}{3}$$

$$\tan \theta = -\sqrt{3}$$

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

$$\boxed{y = -\sqrt{3} x} \quad \text{line}$$

$$38. \quad r = 10$$

$$r^2 = 100$$

$$x^2 + y^2 = 100 \quad \text{circle}$$

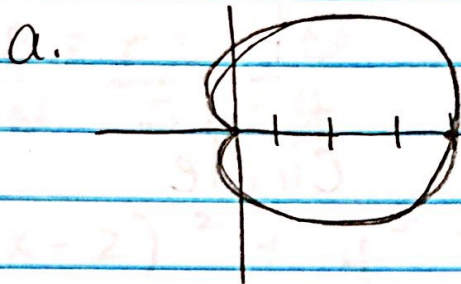
$$39. \quad r = 4 \cos \theta$$

$$r^2 = 4r \cos \theta$$

$$x^2 + y^2 = 4x$$

$$x^2 + y^2 - 4x = 0 \quad \text{circle}$$

47. $r = 2 + 2\cos\theta$



b. $(-2, 0)$ on the negative side of the x-axis directly behind the microphone

61. $y = -4$
 $r = -4\csc\theta$

62. $y = -\sqrt{3}x$
 $\theta = \frac{2\pi}{3}$

63. $x^2 + (y-2)^2 = 4$
 $r = 4\sin\theta$

64. $(x-3)^2 + (y+4)^2 = 25$
 $r = 6\cos\theta - 8\sin\theta$