Answers to Worksheet 1 on Polar

1. $r = 4\csc\theta$
2. $r = \dfrac{-2}{3\cos\theta - 5\sin\theta}$
3. $r = 5$
4. $x = 3$
5. $x^2 + y^2 = 2y$
6. $y = -\dfrac{\sqrt{3}}{3}x$
7. 0
8. -1
9. $-\sqrt{3}$
10. $\dfrac{1}{2}$
11. Horiz: $\left(2, \dfrac{\pi}{2}\right), \left(\dfrac{1}{2}, \dfrac{7\pi}{6}\right), \left(\dfrac{1}{2}, \dfrac{11\pi}{6}\right)$

    Vert.: $\left(\dfrac{3}{2}, \dfrac{\pi}{6}\right), \left(\dfrac{3}{2}, \dfrac{5\pi}{6}\right)$

Answers to Worksheet 2 on Polar

1. $\dfrac{\pi}{3}$
2. 2π
3. 6π
4. $\dfrac{9\pi}{2}$
5. 4
6. $\pi - \dfrac{3\sqrt{3}}{2}$
7. $\pi + 3\sqrt{3}$

8. 2

Answers to Worksheet 3 on Polar

1. $3\sqrt{3}$
2. $\dfrac{8\pi}{3} - 2\sqrt{3}$
3. π
4. $\dfrac{5\pi}{4}$
5. $\dfrac{16\pi}{3} - 4\sqrt{3}$

Answers to Worksheet 4 on Polar

1. $4 - \dfrac{\pi}{4}$
2. $8 + \pi$
3. (a) (1.2, 0.8)

   (b) 0.927

   (c) $r^2 = \dfrac{4}{4\sin^2\theta + \cos^2\theta}$

   (d) 0.927
4. (a) 19.675

   (b) 3.485

   (c) $\dfrac{dr}{d\theta} > 0$ for $(\pi, 4.302)$. This means that the curve is getting farther from the origin.

   (d)

θ	r
π	2.142
4.302	5.245
$\dfrac{3\pi}{2}$	4.712

   The greatest distance is 5.245 when $\theta = 4.302$.

5. (a) 10.667

   (b) $r + r\sin\theta = 4$

   $\sqrt{x^2 + y^2} + y = 4$

   $x^2 + y^2 = 16 - 8y + y^2$

   $8y = 16 - x^2$

   (c) 10.667