

Math 152 Week in Review: Sections 10.2, 10.3

Solutions and questions can be found at the link:

<https://www.math.tamu.edu/~kahlig/152WIR.html>

1. Find the length of the arc of the curve $x = t^2$, $y = t^3$ that lies between the points $(1, 1)$ and $(4, 8)$.

2. Find the length of the curve $x = e^t - t$, $y = 4e^{t/2}$, $0 \leq t \leq 2$

3. Find the length of the curve $y = \frac{x^3}{6} + \frac{1}{2x}$ for $1 \leq x \leq 3$

4. Find the area of the surface obtained by rotating the curve about the y -axis.

$$x = 5 \sin t, \quad y = 5 \cos t, \quad 0 \leq t \leq \pi$$

5. Find the area of the surface obtained by rotating the curve about the x -axis.

$$x = \frac{t^3}{3}, \quad y = t^2, \quad 0 \leq t \leq 1$$

6. Setup the integral that would find the area of the surface obtained by rotating the curve given by the parametric equations given below on the interval $0 \leq t \leq 2$.

$$x = 2t - t^2 \quad y = 3 + t^2$$

(a) about the x -axis.

(b) about the y -axis.

7. Find two other pairs of polar coordinates for the given polar coordinate, one with $r > 0$ and one with $r < 0$ and both with $0 \leq \theta < 2\pi$

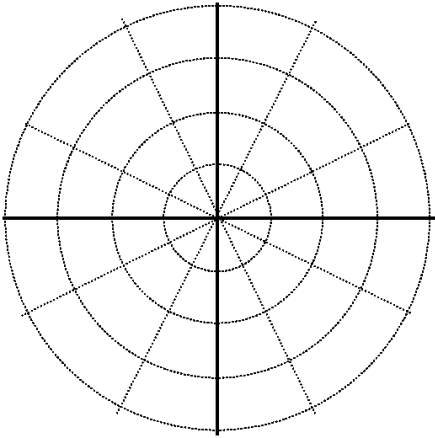
8. Find the Cartesian coordinates of the polar point $\left(4\sqrt{2}, \frac{3\pi}{4}\right)$

9. Give two polar representations for the point $(-5\sqrt{3}, 5)$. One with $r > 0$ and one with $r < 0$.

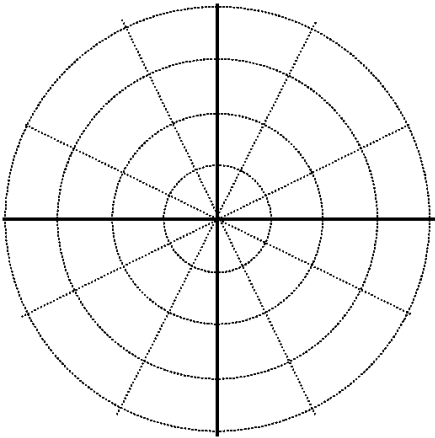
10. Write a Cartesian equation for the polar curve $r = -8 \sin \theta$

11. Write a Cartesian equation for the polar curve $r^2 \sin(2\theta) = 1$.

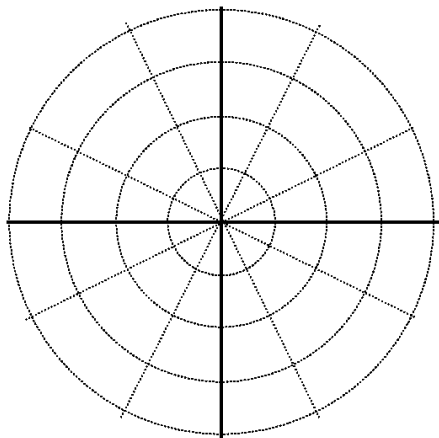
12. Graph $r = 3 \sin(\theta)$



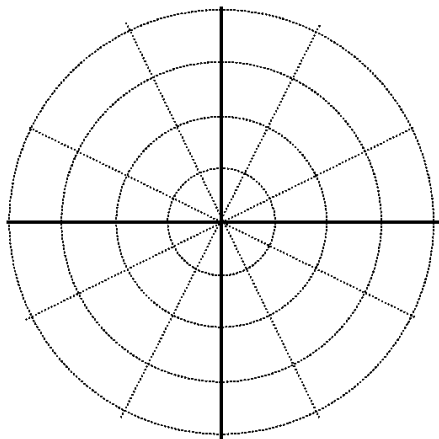
13. Graph $r = 4 \cos(3\theta)$



14. Graph $r = 3 \sin(2\theta)$



15. Graph $r = 2 - 2 \cos \theta$



16. Graph $r = 2 + 3 \sin \theta$

