

Name: _____

1. Find the exact length of the curve $y = \ln(\sec x)$, $0 \leq x \leq \pi/4$.

10 pts

2. Eliminate the parameter from the parametric equations $x = e^t$, $y = e^{-t}$, $-\infty < t < \infty$, to find a Cartesian equation of the curve. **Put a box around your answer.** Sketch the parametric curve, and indicate with an arrow the direction in which the curve is traced as the parameter t increases.

10 pts

3. Sketch the region in the plane consisting of points whose polar coordinates satisfy the conditions $2 < r \leq 5$, $3\pi/4 < \theta < 5\pi/4$.

10 pts

(OVER)

4. Find a set of parametric equations to represent the curve $y = x^2$, $-\infty < x < \infty$. Be sure to include the t -interval.

10 pts

5. Completely set up an integral for the surface area generated by rotating the curve $x = 3t^2$, $y = 2t^3$, $0 \leq t \leq 5$ about the y -axis. **DO NOT evaluate the integral.**

10 pts

6. Use the parametric equations of an ellipse, $x = a \cos \theta$, $y = b \sin \theta$, $0 \leq \theta \leq 2\pi$, to completely set up an integral for the area that the ellipse encloses. **DO NOT evaluate the integral.**

10 pts

7. Find the slope of the tangent line to the polar curve $r = 2 \sin \theta$ at $\theta = \pi/6$.

10 pts

8. Sketch the curve $r = 2 + \cos 2\theta$ and completely set up an integral for the area it encloses. **DO NOT evaluate the integral.**

10 pts

9. Find all the points of intersection of the curves $r = \sin \theta$ and $r = \sin 2\theta$ that lie either on the x - or y - axes or inside Quadrant I.

10 pts

10. Identify the conic section $r = \frac{12}{2 + 4 \sin \theta}$ by converting to Cartesian coordinates. Sketch the graph and label the vertices.

10 pts

--