Name_____

Date_____

Calculus Independent Study Path

Practice Unit 8 Test

1. Find the length of the curve

$$y = \frac{x^4}{4} + \frac{1}{8x^2}$$

between $x = 1$ and $x = 2$.

2. The arc

$$x = t + 1, \qquad y = \frac{1}{2}t^2 + t$$

between $t = 0$ and $t = 4$ is revolved about the y-axis. Find the area of the surface produced.

3. The region between $x = 0$ and $x = 2y - y^2$ is revolved about the x-axis. Find the volume produced.

4. Consider the solid formed by revolving the region bounded by $y = x^2 + 1$, $y = 0$, $x = 0$, and $x = 1$ about the y-axis. Compute its volume by both the shell and disc methods.

5. Find the length of the curve

$$x = a\cos t + at\sin t, \qquad y = a\sin t - at\cos t$$

between $t = 0$ and $t = \pi/2$; a is a positive constant.

6. The arc

$$y = \frac{x^3}{3} + \frac{1}{4x}$$

between $x = 1$ and $x = 3$ is revolved about the line $y = -1$. Find the area of the surface produced.