

Name _____

Instructions:

The exam is open note, open book, work alone, iPod listening is fine. As usual, I want to see details of your work.

Problems:

1) Find the derivative of $y = \sin^2(x^3 - 1)$

2) Find the derivative of $y = \ln\left(\frac{1 - 3x^2}{x + 1}\right)^5$

3) Find the derivative of $y = 7e^{\sqrt{x^2 - 2}}$

4) Determine the center and radius of the following circle. Sketch the circle, indicating the axes and center.

$$(x - 1)^2 + (y - 2)^2 = 25$$

5) Determine the coordinates of the focus and the equation of the directrix of the given parabola. Sketch the parabola, indicating the axes, focus, and directrix.

$$2y^2 - 3x = 0$$

6) Find the equation of the ellipse satisfying the given condition. The center is at the origin. Sketch the ellipse, indicating the axes, vertices, and foci.

$$\text{Vertex: } (0, 13), \text{ and focus: } (0, 12)$$

7) Find the coordinates of the vertices and foci of the given hyperbola. Sketch the hyperbola, indicating the axes.

$$y^2 = 9(x^2 + 1)$$