

### 3.6 Calculating Higher-Order Derivatives

Calculus

Name: \_\_\_\_\_

**CA #1**

**Find  $\frac{d^2y}{dx^2}$  based on the given information.**

1.  $y = 2xe^{-x}$

2.  $x^2y = 5$

3.  $\cos y = 2x^2$

**Evaluate the 2<sup>nd</sup> derivative at the given point.**

4. If  $f(x) = 4x^3 - 2x^{-3}$ , find  $f''(-1)$ .

5. If  $f(x) = \sin x - \cos x$ , find  $f''\left(\frac{\pi}{6}\right)$ .

6. If  $\frac{dy}{dx} = x^2 - 5y^2$ , find  $\frac{d^2y}{dx^2}$  at  $\left(2, \frac{1}{2}\right)$

7. If  $\frac{dy}{dx} = y^2 \sin x$ , find  $\frac{d^2y}{dx^2}$  at  $\left(\frac{\pi}{6}, 1\right)$

1. $2e^{-x}(x-2)$	2. $\frac{x^2}{6y}$	3. $-4 \csc y - 16x^2 \csc^2 y \cot y$	4. 0
5. $-\frac{1}{2} + \frac{\sqrt{3}}{2}$	6. $-\frac{4}{39}$	7. $\frac{2}{1+\sqrt{3}}$	