

Name: Key Date \_\_\_\_\_**Instructions:** For each question, neatly write a solution and circle your answer.

1. Compute the first and second derivatives for the function  $f(x) = 3\sec(x) - 2\sin(x)$ . Please simplify your answer.

$$f'(x) = 3\sec(x)\tan(x) - 2\cos(x)$$

$$\begin{aligned} f''(x) &= 3\sec(x) \cdot \sec^2(x) + 3\tan(x)\sec(x)\tan(x) + 2\sin(x) \\ &= 3\sec^3(x) + 3\tan^2(x)\sec(x) + 2\sin(x) \end{aligned}$$

2. If  $g(x) = (e^{2x} + \cos(x))^3$ , what is  $g'(x)$ ?

$$g'(x) = 3(e^{2x} + \cos(x))^2 (2e^{2x} - \sin(x))$$

3. If  $h(x) = \frac{\tan(\pi x)}{x^2}$ , what is  $h'(x)$ ?

$$h'(x) = \frac{x^2 \cdot \pi \sec^2(\pi x) - 2x \tan(\pi x)}{x^4}$$