

Name:**Tutorial time:**

1. Find an equation for the line tangent to the graph of the given function f at the point $(a, f(a))$:

(a) $f(x) = (3x^2 + 2)\tan(x)$, $a = 0$.

(b) $f(x) = \frac{x^2 - 2x + 3}{x^2 + 4}$, $a = 1$.

(c) $f(x) = (x^4 + 2x)^5$, $a = -1$

2. Compute the derivative of $f(x) = \sin(2x)$:

(a) Using the Chain Rule.

(b) Using the identity $\sin(2x) = 2 \sin(x) \cos(x)$.

Do your answers in parts (a) and (b) agree?

3. Given $f(x) = \tan(x)$, compute $f''(x)$ (also denoted $\frac{d^2}{dx^2}(\tan(x))$).

4. Discuss with your classmates, but don't hand in:

Determine values of A and B such that the derivative of

$$f(x) = \begin{cases} Ax^2 + Bx + 2, & \text{if } x \leq 2, \\ Bx^2 - A, & \text{if } x > 2 \end{cases}$$

is everywhere continuous. (Hint: note that if $f'(x)$ exists, $f(x)$ itself must be continuous.)