
1. (1 pt) If $f(x) = 6 + 7x - 4x^2$, find $f'(5)$.

2. (1 pt) Let

$$f(x) = \sqrt{3 + 5x}$$

$f'(3) =$ _____

3. (1 pt) Find a and b such that the function

$$f(x) = \begin{cases} x^2 + 2x - 1 & \text{if } x \leq 1 \\ ax + b & \text{if } x > 1 \end{cases}$$

is differentiable everywhere.

$a =$ _____

$b =$ _____

4. (1 pt) Let $f(x)$ be the function $\frac{1}{x+12}$. Then the quotient $\frac{f(8+h)-f(8)}{h}$ can be simplified to $\frac{-1}{ah+b}$ for:

$a =$ _____

and

$b =$ _____

5. (1 pt) If $f(x) = \frac{1}{x^2}$, find $f'(1)$.

6. (1 pt) If $f(x) = 4x^2 - 6x + 2$, find $f'(5)$. _____

Use this to find the equation of the tangent line to the parabola $y = 4x^2 - 6x + 2$ at the point $(5, 72)$. The equation of this tangent line can be written in the form $y = mx + b$ where m is: _____ and where b is: _____

7. (1 pt) If $f(x) = \frac{5}{x-3}$, find $f'(5)$.

Use this to find the equation of the tangent line to the curve $y = \frac{5}{x-3}$ at the point $(5, 2.50000)$. The equation of this tangent line can be written in the form $y = mx + b$ where m is:

_____ and where b is: _____

8. (1 pt) If $f(x) = 3x + 2\sqrt{x}$, find $f'(4)$.

Use this to find the equation of the tangent line to the curve $y = 3x + 2\sqrt{x}$ at the point $(4, 16.00000)$. The equation of this tangent line can be written in the form $y = mx + b$ where m is:

_____ and where b is: _____