

Show all work and circle/box your final answer. All answers must be simplified unless stated otherwise.

The limit definition of the derivative of $f(x)$ is

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

The derivative gives a formula for the slope of the line tangent to the curve of $f(x)$.

1. Using the limit definition of the derivative, find the equation of the line tangent to the curve $f(x) = x^2 + x + 5$ at $x = 2$
2. Using the limit definition of a derivative, find the derivative of $f(x) = \sqrt{3x+1}$