

Written HW8 – MATH 2501 Fall 2021

Due by 10 September for timely completion credit

In this homework you will compute slopes of tangent lines using the limit process. Recall that the slope of the tangent line to $f(x)$ at $x = a$ is given by

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

For the duration of this problem, let $f(x) = 3x^2 - 2$.

- (1) Compute the slope $f'(x)$ using the limit definition.
- (2) Use your answer from (1) to find an equation of the tangent line at $x = 2$.
- (3) Use your answer from (1) to find an equation of the tangent line at $x = -1$.
- (4) Use your answer from (1) to find an equation of the tangent line at $x = 0$.
- (5) Plot $f(x)$ and the three tangent lines you found in the previous parts of this problem and attach a screenshot of it to your submission. Doing this in software (e.g. Desmos) is encouraged.