Written HW5 – MATH 2501 Fall 2020

Due by Wednesday, 9 September for timely completion credit

In this homework you will compute slopes of tangent lines using the limit process (as we did in the 7 September class). Recall that the slope of the tangent line to $f(x)$ at $x = a$ is given by

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

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

(1) Compute the slope at $x = x$, i.e. compute $f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$.

(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 tangnet lines you found in the previous parts of this problem and attach a screenshot of it to your submission.