Worksheet 5, Math 1551, Fall 2017

Sections from Thomas 13^{th} Edition: 3.1, 3.2, 3.3

Exercises

1. Let $f(x) = \sqrt{5-x}$.
   (a) Use the limit definition of the derivative to compute the derivative of the function.
   (b) For what values of x is f differentiable? Write your answer as an interval.
2. Identify all points (x, y) on the graph of
$$g(x) = \frac{1}{3}x^3 - \frac{3}{2}x^2 + 1$$
where the tangent line is parallel to the line $8x - 2y = 1$.
3. Sketch a function, $y(x)$, that is defined on the domain $x \in [-4, 4]$, is continuous, odd, and not differentiable at exactly two points. Label your axes.
4. Give a formula for a function $y(x)$, that is continuous everywhere but not differentiable at $x = 1$.
5. Compute the slope of the tangent line to $f(x)$ at the point where $x = 1$.
$$f(x) = \frac{5x+1}{4x^2+1}$$