More review for quiz 2

2025-10-01

Here are a few more problems like our quiz this Friday.

Problems

1. Use the differentiation rules to compute the derivatives of the following functions.

   a. $f(x) = x\tan(x)$

   b. $f(x) = \dfrac{\sqrt{x}}{x^2+1}$

2. Use the fact that $\lim_{\theta\to 0} \sin(\theta)/\theta = 1$ to compute

$$\lim_{x\to 0} \frac{\tan(4x)}{3x}.$$

3. Sketch the graph of

$$f(x) = -\sin(\pi x).$$

Be sure to clearly indicate the x and y intercepts, as well as the maximum and minimum values.

4. Supposing that f and g are differentiable functions, use the definition of the derivative to show that

$$\frac{d}{dx} f(x) + 3g(x) = f'(x) + 3g'(x).$$