Chapter 3.5: Differentiating Trig Functions

Calculus I

College of the Atlantic. Winter 2021

1. Take the derivative of the following functions:

   (a) $f(x) = \sin(2x)$

   (b) $f(x) = \cos(x)\sin(x)$

   (c) $f(x) = e^{-\cos(2x)}$

   (d) $f(x) = \sin^2(x)$

   (e) $f(x) = \sin(x^2)$

2. Let $f(x) = \sin(x)$.

   (a) Sketch $f(x)$ and $f'(x)$.

3. Let $g(x) = \sin(2x)$.

   (a) Determine $g'(x)$.

   (b) Sketch $g(x)$ and $g'(x)$.

   (c) Why do the graphs have the shape they do? Compare to $f(x) = \sin(x)$ from the previous problem.

4. Let $f(x) = \sin(2x)$. Determine $f'(4)$ two different ways:

   (a) Use difference quotients and your calculator.

   (b) Use the shortcut for $\sin(x)$ and the chain rule.