

1. Consider the following twelve functions:

$$f_1(x) = \cos\left(\frac{x^2 + 1}{x^{34} + 7}\right)$$

$$g_1(x) = \sin(3x^2 + 1)$$

$$f_2(x) = e^{2x^2 - 8x + 3}$$

$$g_2(x) = \frac{3^x + x^3}{e^x - \sqrt{2x + 1}}$$

$$f_3(x) = e^{-3x} \tan(7x)$$

$$g_3(x) = \sqrt[5]{x^7 + 13x - 5}$$

$$f_4(x) = \sin e^x$$

$$g_4(x) = \cos \sqrt{x + 1}$$

$$f_5(x) = (1.07)^x$$

$$g_5(x) = e^{\sin x \cos x}$$

$$f_6(x) = e^{17x} + (17e)^x$$

$$g_6(x) = x^\pi \pi^x$$

Compute their derivatives. **DO NOT SIMPLIFY** your answers. **Pro tip:** If you can use the chain rule correctly without writing out the chains, great; but if you run into trouble, try writing out $y = g(u)$, $u = f(x)$, or $y = h(w)$, $w = g(u)$, $u = f(x)$, etc.

2. Stump your neighbors!

- Everyone in your group, make up a function using any of the calculus formulas we have seen. (This is essentially any function you have ever seen, with the exception of logs, whose derivatives we won't see until Section 3.6.)
- Pass your functions to another group.
- You should now be looking at a function made up by someone else in the class. See if you can find its derivative.