This quiz covers: 2.7, 2.8, 3.1, 3.2, and 3.3.

Directions: Complete all questions and **show all applicable work.** Partial credit will be given. All questions are equally weighted.

1.) Draw a function $f(x)$ that satisfies the following properties. Also specify what each item tells about the function $f(x)$ in words.

(a) $f'(2) = 0$

(b) $f'(x) > 0$ for $x > 2$

(c) $f'(x) < 0$ for $x < 2$

(d) $f''(x) > 0$ for all x

2.) Find the derivative of $f(x) = x^2 + e^x$.

3.) Compute the derivative of $f(x) = \dfrac{\cos(x)}{\sin(x)}$.
(Hint: The identity $\sin^2(x) + \cos^2(x) = 1$ implies $-\sin^2(x) - \cos^2(x) = -1$)