

Worksheet week 3 - MAC 2311, Spring 2013

1. (a) Find the tangent line to the curve $y = (1 + x) \cos x$ at $x = 0$.
(b) Find the tangent line to the curve $y = x/(1 + x^2)$ at $x = 3$.
(This curve is called a "serpentine". Plot it in Wolframalpha to see why.)
(c) Find the points on the curve $y = \cos x/(2 + \sin x)$ at which the tangent line is horizontal.

2. Show that the function $f(x) = |x - 6|$ is not differentiable at $x = 6$. Find a formula for f' and sketch its graph.

3. (a) Prove that $\frac{d}{dx}(\cot x) = -\csc^2 x$.
(b) Find $\frac{d^{35}}{dx^{35}}(x \sin x)$.