Name: _____ Mark: _____

Mini-math Div 3/4: Monday, October 25, 2021 (15 minutes)

1. Find $\dfrac{dy}{dx}$ in the following cases:
   (a) (2 points) $y = xg(\sin x)$, where $g(x)$ is a differentiable function

   (b) (2 points) $y = e^{e^{\tan x}}$

   (c) (2 points) (AP) $y = \frac{\arctan x}{x}$

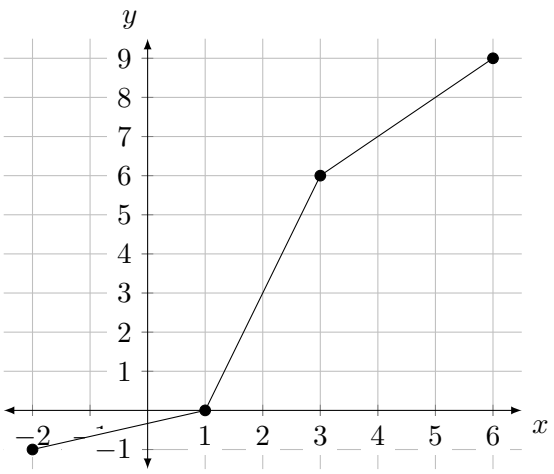
   (d) (2 points) $x^2y - x = \sin(x + y)$

2. (2 points) Find y'' if $y = \tan x^2$.

3. (2 points) The differentiable function $f(x)$ has the following values and derivatives:

x	$-2/3$	$-1/3$	3	6	7	8
$f(x)$	1	2	-9	-11	5	3
$f'(x)$	3	4	9	10	7	8

The function $g(x)$ is shown below:



Graph of g

If $h(x) = f(g(x))$, find the equation of the tangent line to $h(x)$ at $x = 2$.

4. (2 points) (AP) Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(-9) = 7, \quad f(8) = 6, \quad f(6) = -9, \quad f(7) = 8$$
$$f'(-9) = 6, \quad f'(8) = 4, \quad f'(6) = -4, \quad f'(7) = 3$$

Find $g'(-9)$.