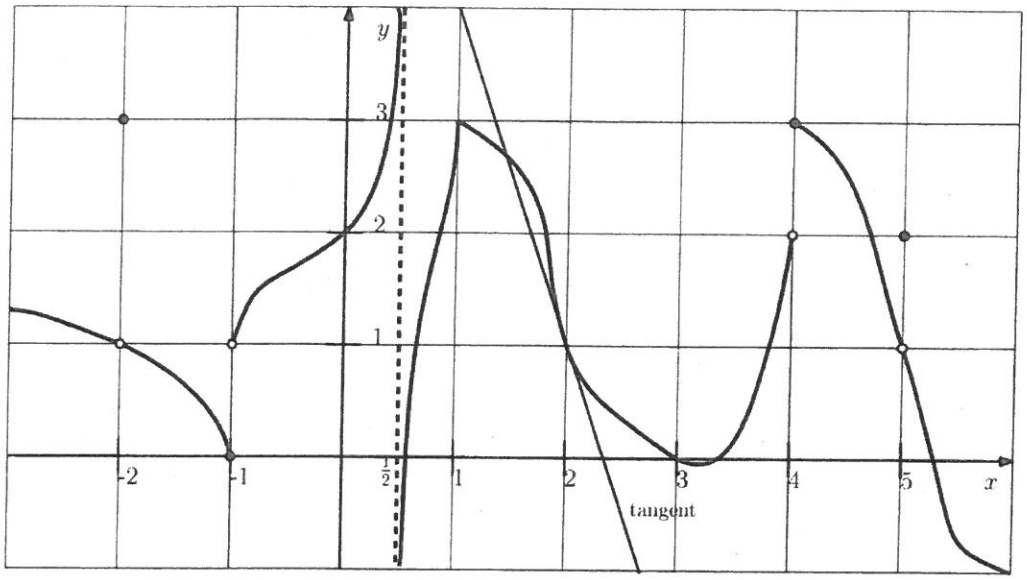
Math 1210: Quiz #4 **Fall 2017**

Name: SOLUTION	A#:	Section: A, B

[8] 1. Let f be a function whose graph of $y = f(x)$ is given below.



Fill in the following.

(a) List all x where f is not continuous: $-2, -1, \frac{1}{2}, 4, 5$

(b) List all x where f is continuous, but not differentiable: 1

(c) List all x where f is right-continuous, but not continuous: 4

(d) $\lim_{x\to 5}(f(x)+1)^2 =$ $(1+1)^2 = \boxed{4}$

(e) $\lim_{x\to 0} f(e^x) =$ $\lim_{x\to 0} f(e^x) = f(1) = \boxed{3}$

(f) $f'(2) =$ -3

(g) If $g(x) = x^2 f(x)$, then $g'(2) =$ $\left(2x f(x) + x^2 f'(x)\right)\Big|_{x=2} = 2\cdot 2\cdot 1 + 2^2\cdot(-3) = \boxed{-8}$

(h) If $h(x) = f(2x)$, then $h'(1) =$ $2f'(2x)\Big|_{x=1} = 2f'(2) = \boxed{-6}$

v4.AB

[4] 2. Find the equation of the tangent line to $y = x^2 + 1$ at $x = 2$.

$y' = 2x$, $y|_{x=2} = (2)^2 + 1 = 5$, $y'|_{x=2} = 2(2) = 4$

Line: $\boxed{y - 5 = 4(x-2)}$ or $\boxed{y = 4x - 3}$

[8] 3. Compute the derivative. **Do not simplify your answer.**

(a) $\frac{d}{dx}\left(\tan(x) + \frac{1}{x^2} + e^{2x} + \sin(4)\right) =$ $\sec^2 x \quad -2x^{-3} \quad +2e^{2x} \quad +0$

(b) $\frac{d}{dt}\left(\frac{\sin(t)}{e^t + 1}\right) =$ $\frac{(\cos t)(e^t+1) - (\sin t)e^t}{(e^t+1)^2}$.