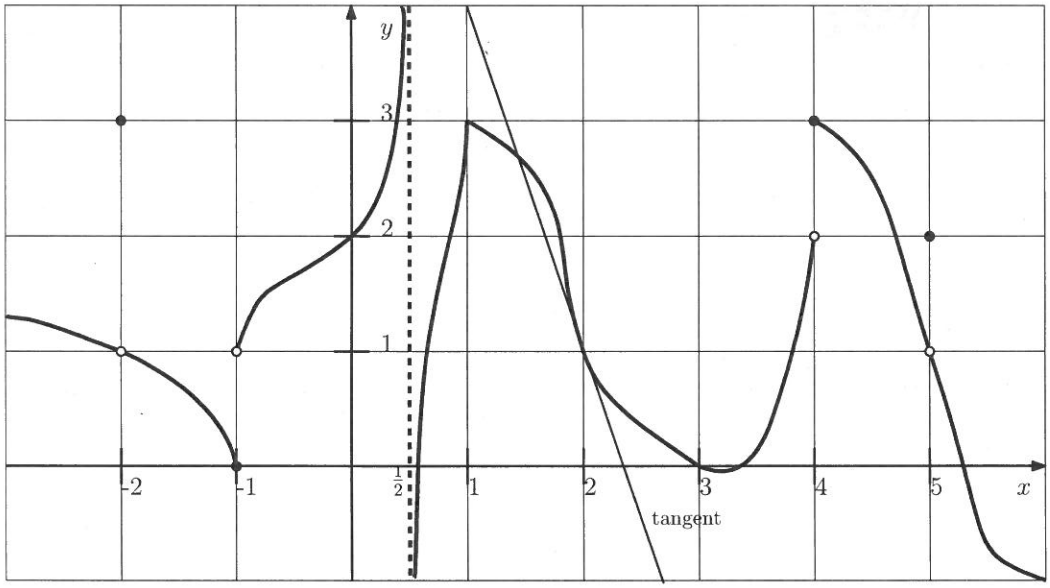
Math 1210: Quiz #4 — Fall 2017

Name:	A#:	Section:

[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) $\lim_{x\to 2}(f(3x-1)+(3x-1))^2 =$ $(1+5)^2 = 36$

(e) $\lim_{x\to 2} f(ln(e^{x+1})) =$ 0

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

(g) If $g(x) = x^2 f(x)$, then $g'(2) =$ $4 + 4\times(-3) = -8$ $\quad g'(x) = 2xf(x) + x^2 f'(x)$

(h) If $h(x) = f(2x)$, then $h'(1) =$ $2\times(-3) = -6$ $\quad h'(x) = 2f'(2x)$

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

$f'(x) = 2x + 2 \longrightarrow f'(-1) = -2 + 2 = 0$

slope $= 0$

$f(-1) = 1 - 2 + 2 = 1$

$\Longrightarrow y = \underbrace{m}_{0} x + b = b$

equation: $y = 1$

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

(a) $\dfrac{d}{dx}\left(\sin(x) + \dfrac{1}{\sqrt{x}} + e^{2x+1} + \cos(3)\right)$

$= \dfrac{d}{dx}(\sin(x)) + \dfrac{d}{dx}\left(\dfrac{1}{\sqrt{x}}\right) + \dfrac{d}{dx}\left(e^{2x+1}\right) + \dfrac{d}{dx}(\cos(3))$

$= \cos(x) + \dfrac{\frac{-1}{2\sqrt{x}}}{x} + 2e^{2x+1} + 0$

(b) $\dfrac{d}{dt}\left(\dfrac{\tan(t+1)}{e^{2t}+1}\right) = \dfrac{(e^{2t}+1)\frac{d}{dx}(\tan(t+1)) - (\tan(t+1))\frac{d}{dx}(e^{2t}+1)}{(e^{2t}+1)^2}$

$= \dfrac{(e^{2t}+1)(\sec^2(t+1)) - (\tan(t+1))(2e^{2t})}{(e^{2t}+1)^2}$