Math 1210: Quiz #1 Winter 2017

Name:	A#:	Section:

[4] 1. If $f(x) = \dfrac{2x}{x^2 - 2x + 4}$ and $g(x) = x^2 + 1$ then (do not simplify)

$f(g(x)) =$ ______________________________

$g(f(x)) =$ ______________________________

[4] 2. Circle equations of lines. (negative points for all wrong circles)

$3x + 2y + 7 = 0$	$y = 3x + \cos x$	$y = 3x + \cos(y)$	$x = \ln(7)$
$5x + (\sin 1)y = 8$	$(y - e^3) = 5(x - \cos 3)$	$y - 1 = e^y(x - 3)$	$xy = 0$

[4] 3. State the slope of the line, the x-intercept, the y-intercept, and the slope of any perpendicular line to the line L given by the equation $2x + 5y + 3 = 0$.

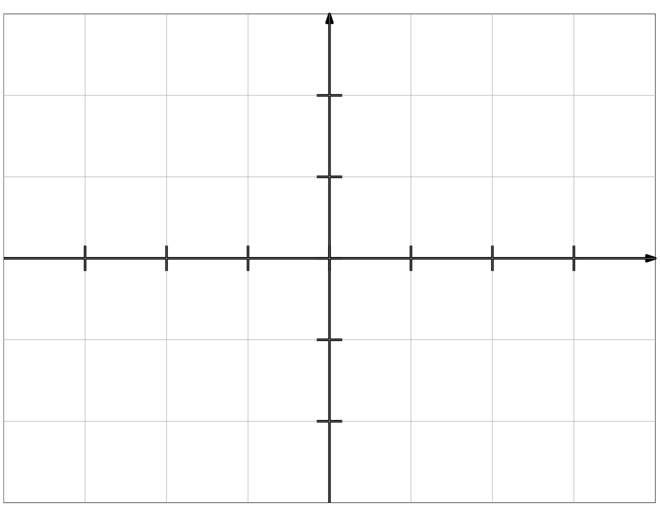
The slope of L is ________

The $x-$ intercept of L is ________

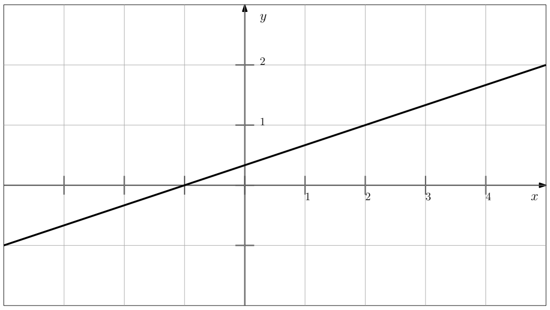
The $y-$ intercept of L is ________

The slope of any line perpendicular to L is ________

[2] 4. Sketch the graph of $y = \tan^{-1}(x)$ below.



[2] 5. Find the equation of the line L shown on the graph below.



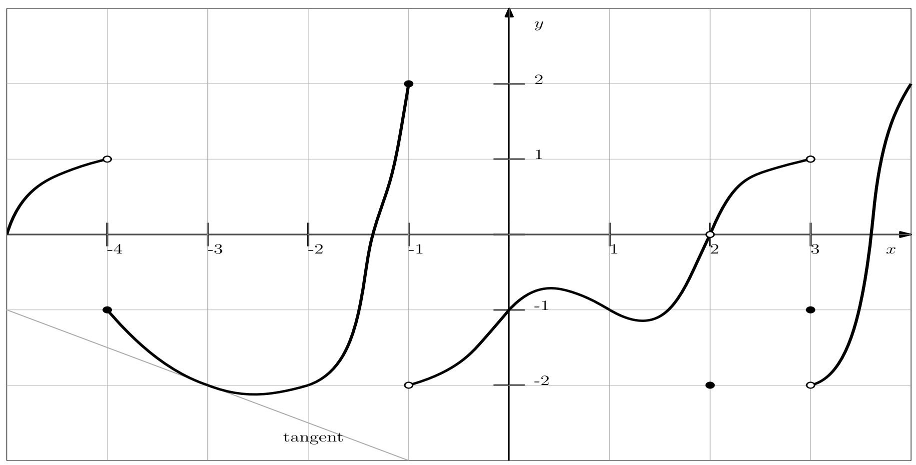
equation of L : ______________________________

[4] 6. Find the equation of the secant line L to the curve $y = x^3 - 2x - 1$ on the interval $[0, 2]$. *(Recall that a secant line to the curve $y = f(x)$ on the interval $[a, b]$ is the line passing through points $(a, f(a)), (b, f(b))$ and usually has no relationship to the* $\sec x$ *function.)*

Math 1210: Quiz #2 — Fall 2017

Name:	A#:	Section:

[9] 1. Let f be a function whose graph of $y = f(x)$ is given below. Compute the following quantities or state that they do not exist.



(a) $f(3) =$ ________________

(b) $\lim_{x\to 3} f(x)$ ________________

(c) $\lim_{x\to 2}(x^2 + f(x))$ ________________

(d) $\lim_{x\to 1^-} f(x)$ ________________

(e) $\lim_{x\to -1^+} f(x)$________________

(f) $\lim_{x\to -4^-} e^x f(x)$________________

(g) The average rate of change of $f(x)$ over the interval $[-3, -1]$ ____________

(h) The instantaneous rate of change of $f(x)$ when $x = -3$ ____________

(i) The equation of the secant line over the interval $[-3, -1]$ __________________________

$\boxed{\text{v2.AB}}$

[**3**] 2. Let $f(x) = \begin{cases} x^2 - 1, & \text{if } x < 2 \\ e^{x-2}, & \text{if } x \geq 2 \end{cases}$. Then

(a) $\lim\limits_{x \to 2^-} f(x) =$ ______________

(b) $\lim\limits_{x \to 1^+} f(x) =$ ______________

(c) The average rate of change of f over the interval $[2, 4]$ is ______________

[**8**] 3. Compute the limit or state that it does not exist.

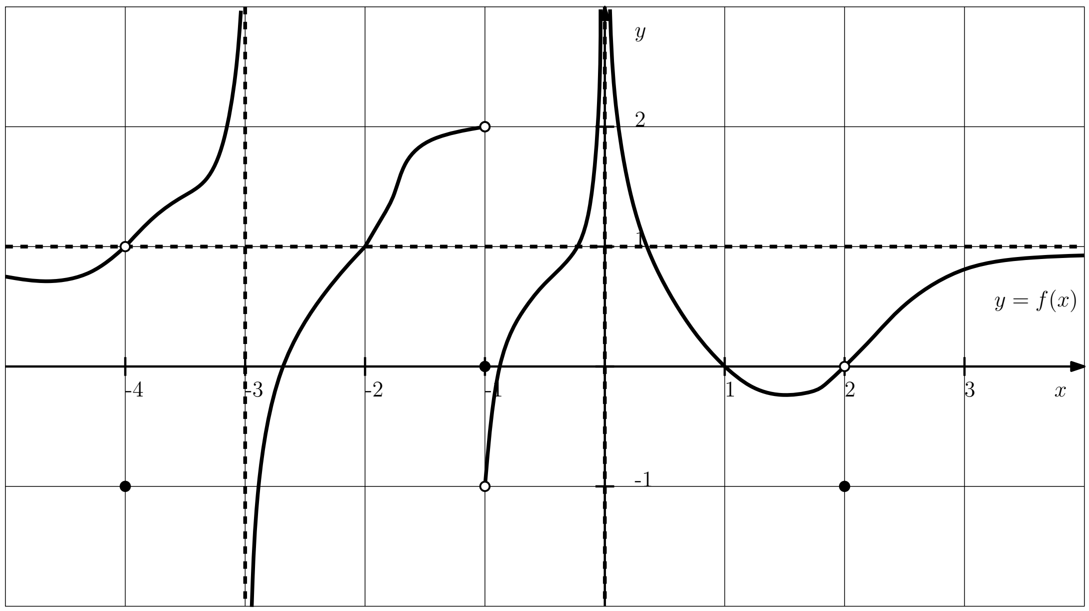
(a) $\lim\limits_{x \to -2} \dfrac{x+2}{\sqrt{x^2+x+2}-2}$

(b) $\lim\limits_{x \to 3^-} \dfrac{|x-3|}{x^2-x-6}$

Math 1210: Quiz #3 **Fall 2017**

Name:	A#:	Section:

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



Then

(a) $\lim_{z \to -4^-} f(z) =$ _______________

(b) $\lim_{s \to -3^+} f(s) =$ _______________

(c) $\lim_{z \to -1^-} f(z) =$ _______________

(d) List all numbers a for which $\lim_{s \to a} f(s)$ does not exist: ____________________

(e) List all horizontal asymptotes: ____________________

(f) List all vertical asymptotes: ____________________

[2] 2. List all vertical asymptotes of $y = \dfrac{(x+2)^3(x-3)^2 \ln|x|}{(x+3)^2(x+2)^2(x-3)^3}$: ____________________

[**4**] 3. Find all horizontal asymptotes of $y = \dfrac{e^{2x} - 2e^{-3x}}{3e^{2x} + 5e^{-3x}}$.

[**8**] 4. Compute the limits or show that they do not exist.

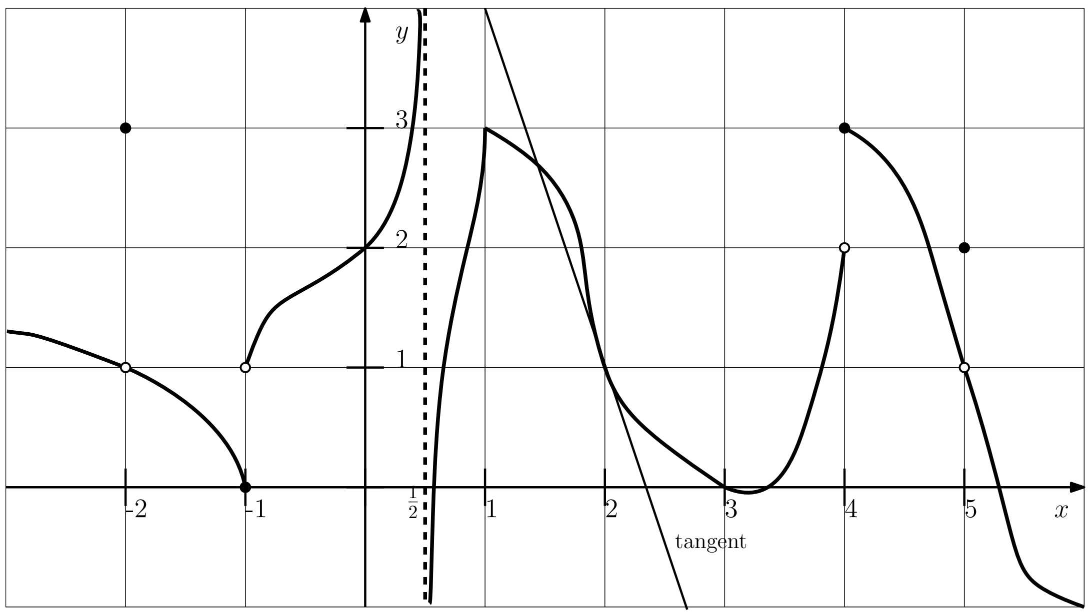
(a) $\displaystyle\lim_{t\to\infty} \frac{t^2 + \sin t}{3t^2 - 2\ln(t)}$

(b) $\displaystyle\lim_{x\to\infty} \left(\sqrt{x^2 - 2x + 5} - x\right)$

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: ____________________

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

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

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

(e) $\lim_{x\to 0} f(e^x) =$ ____________________

(f) $f'(2) =$ ____________________

(g) If $g(x) = x^2 f(x)$, then $g'(2) =$ ____________________

(h) If $h(x) = f(2x)$, then $h'(1) =$ ____________________

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

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

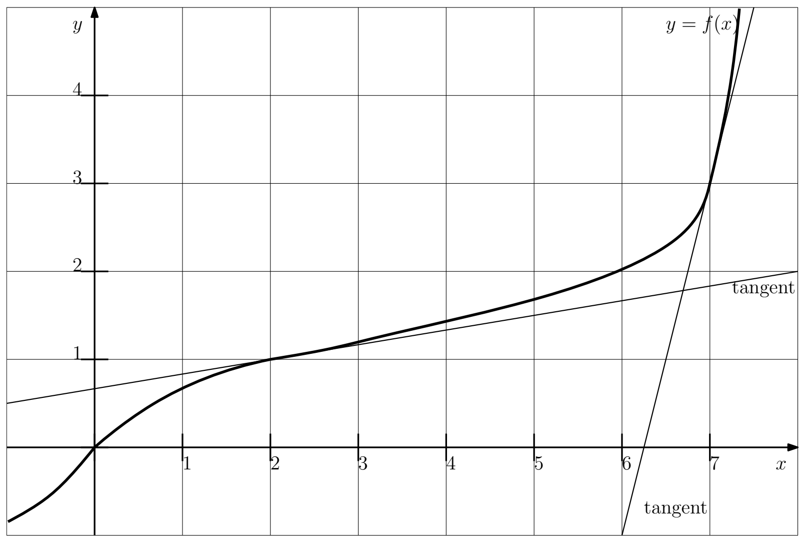
(a) $\dfrac{d}{dx}\left(\tan(x) + \dfrac{1}{x^2} + e^{2x} + \sin(4)\right)$

(b) $\dfrac{d}{dt}\left(\dfrac{\sin(t)}{e^t + 1}\right)$

Math 1210: Quiz #5 — Fall 2017

Name:	A#:	Section:

[8] 1. Let f be a function whose graph of $y = f(x)$ is given below and let $g = f^{-1}$ be its inverse function.



Fill in the following.

(a) $g(2) =$ ____________________

(b) $\lim_{h \to 0} \dfrac{f(2+h) - f(2)}{h} =$ ____________________

(c) The instantaneous rate of change of $f(x)$ when $x = 7$ is____________________

(d) $g'(3) =$ ____________________

(e) If $h(x) = f(2x^2 - 1)$, then $h'(2) =$ ____________________

(f) If $k(x) = g(x)\ln(x)$, then $k'(3) =$ ____________________

(g) If $F(x) = \tan^{-1}(f(x))$, then $F'(2) =$ ____________________

(h) Tangent line to the curve $y = 2f(x)$ at $x = 2$ is ____________________

[4] 2. Compute the derivative. **Do not simplify.**

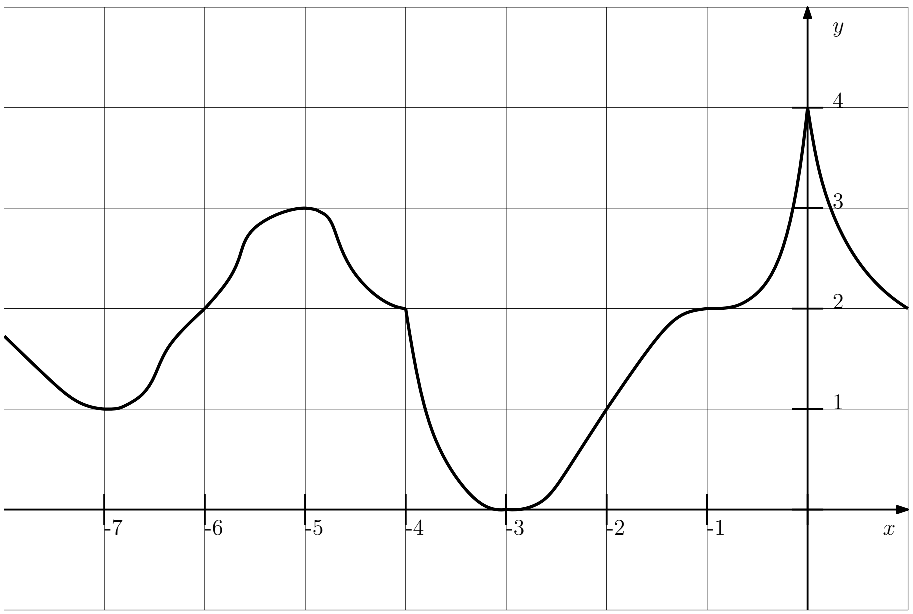
3. $\frac{d}{dt}\left(\sec(e^t) + \tan^{-1}(4) + \sin^{-1}(2t) + \ln(t^4+1)\right)$

[8] 4. Consider the curve given by $xy^2 = 5 + x^2 + y$. Find the equation of the tangent line given to the curve at the point $(3, -2)$.

Math 1210: Quiz #6 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) The critical values of f are: ________________

(b) f has local minima at: ________________

(c) f has local maxima at: ________________

(d) On the following intervals we have $f'(x) > 0$: ________________

(e) The global maximum of f on $(-8, 1)$ is ________________

(f) The global minimum of f on $(-8, 1)$ is ________________

(g) The global maximum of f on $[-7, -6]$ is ________________

(h) The global minimum of f on $[-2, 0]$ is ________________

v6.AB

[**3**] 2. List and classify critical points of f, if its **derivative** is given by

$$f'(x) = \frac{(x-2)^3 x^2}{\sqrt[3]{x+2}}$$

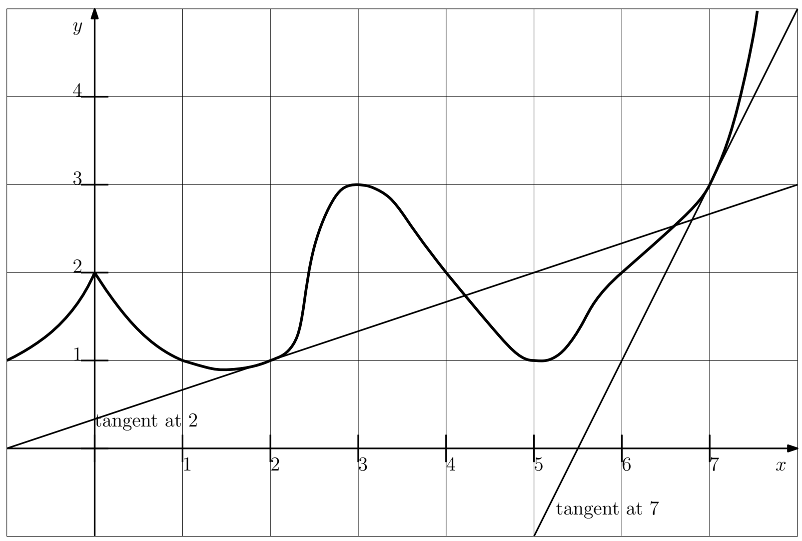
[**4**] 3. Let x, y be functions of t related by $4x^2y^2 = x^4 + y^4$. Compute $\frac{dy}{dt}$ in terms of $x, y, \frac{dx}{dt}$.

[**5**] 4. Find the global (absolute) maximum and the global minimum of $f(x) = x^3 + 6x^2$ on $[-5, -1]$.

Math 1210: Quiz #8 Fall 2017

Name:	A#:	Section:

[7] 1. Let f be a function whose graph of $y = f(x)$ is given below. Let L_2 be the linearisation (linear approximation) of f centred at 2 and let L_7 be the linearisation of f centred at 7.



Fill in the following.

(a) For the following values of x we have $f'(x) = 0$:________________________

(b) The global maximum of of $f(x)$ on the interval $(4, 7]$ is: ____________________

(c) The global maximum of of $f(x)$ on the interval $(-1, 6)$ is: ____________________

(d) $L_2(x) =$ ____

(e) The error in estimating $f(5) \approx L_7(5)$ is _______________

(f) If dy is the differential of $y = f(3+x^2)$ centred at 2, then $dy(dx) =$ ________________

and $dy(-1) =$ ________________

v8.AB

2. Let $f(x) = e^x$.

[6] (a) Find the linearisation (linear approximation) $L(x)$ of $f(x)$ centred at 0.

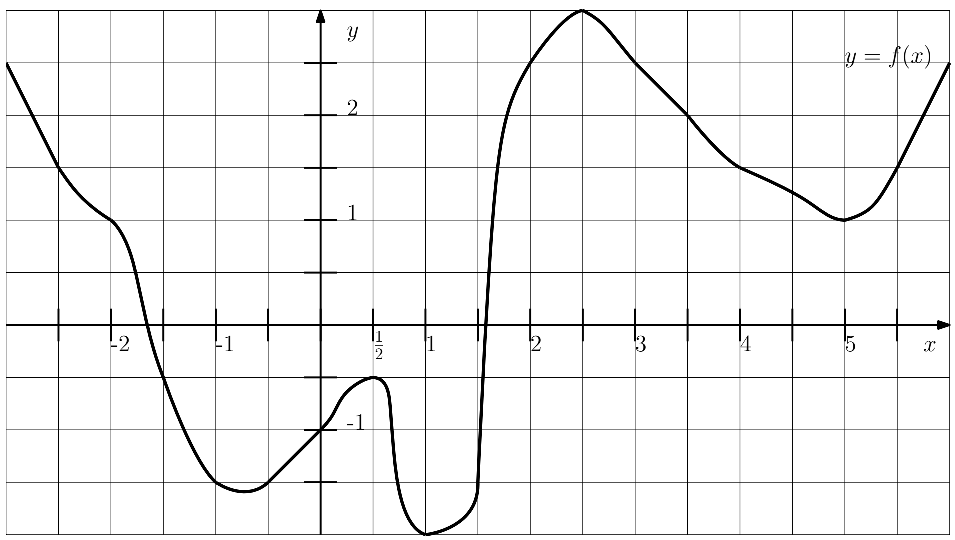
[2] (b) Use the linearisation above to estimate $e^{0.1}$.

[5] (c) Is $L(0.1)$ larger or smaller then $e^{0.1}$? Justify your answer.

Math 1210: Quiz #9 — Fall 2017

Name:	A#:	Section:

[7] 1. Let f be a function whose graph of $y = f(x)$ is given below. Let L_N and R_N denote the left-endpoint, respectively right end-point, Riemann sums with N subintervals of equal size. Fill in the following.



(a) Estimate the area under the curve over $[2, 5]$ by L_2: ______________________

(b) Estimate the area under the curve over $[2, 4]$ by R_4: ______________________

(c) Estimate $\int_{-1}^{2} f(x)dx$ by L_2: ____________________________________

(d) Estimate $\int_0^3 \left(f\left(\frac{x}{2}\right) + 1\right)^2 dx$ by R_3: ______________________________

(e) If $F(x) = \int_0^x f(t)dt$, then $F'(3) =$ __________________

(f) If $G(x) = \int_{-1}^{x^2} t^2 f(t+1)dt$, then $G'(x) =$ ____________________________________

and $G'(2) =$ __________________

[4] 2. Solve the initial value problem $\frac{dy}{dx} = 3e^{2x}$, $y(0) = 4$.

3. Compute the integral.

[5] (a) $\displaystyle\int \left(\sin(2x) + \frac{2}{1+x^2} + \sec^2(3x) + e^3 + x^{-3}\right) dx$

[4] (b) $\displaystyle\int_1^2 \frac{1+t^2}{t} dt$

Math 1210: Quiz #10 Fall 2017

Name:	A#:	Section:

[5] 1. $\int (2x+1)(x^2+x+2)^{17} dx$

[5] 2. $\int \sec^2(x) e^{\tan(x)} dx$

v10.AB

[**5**] 3. $\int_1^e \frac{\ln(x)}{x} dx$

[**5**] 4. $\int_0^{\frac{\pi}{2}} \frac{\cos(x)}{\sin(x)+1} dx$