Math 1210: Quiz #1 **Winter 2017**

Name: SOLUTIONS (MICAH	A#:	Section: EF

[4] 1. If $f(x) = \dfrac{3x}{x^2 - 2x + 3}$ and $g(x) = x^2 + 1$ then (do not simplify)

$f(g(x)) =$ $3(x^2+1)/((x^2+1)^2 - 2(x^2+1)+3)$

$g(f(x)) =$ $\left(\dfrac{3x}{x^2-2x+3}\right)^2 + 1$

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

$3x + 2y + 7 = 0$	$y = 4x + \cos x$	$y = 3x + \cos(y)$	$x = \ln(7)$
$5x + (\sin 1)y = 8$	$(y - e^3) = -5(x - \tan 3)$	$y - 1 = e^y(x^2 - 3)$	$xy = 0$

[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 $2x + 3y + 3 = 0$. $y = \dfrac{-2x-3}{3} = -\frac{2}{3}x - 1$

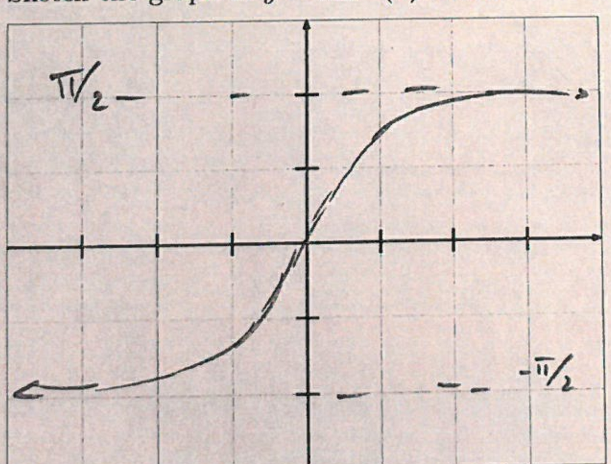
The slope of L is $-2/3$

The x – intercept of L is $-3/2$

The y – intercept of L is -1

The slope of any line perpendicular to L is $3/2$

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



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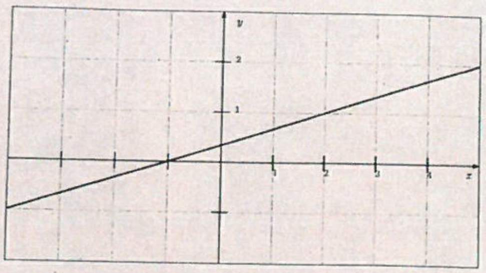
[2] 5. Find the equation of the line L shown on the graph below.



$m = 1/3$ (since $(-1,0)$ and $(2,1)$ are on it)

$y = \frac{1}{3}x + b$

$0 = \frac{1}{3}(-1) + b$ so $b = \frac{1}{3}$

$y = \frac{x+1}{3}$

equation of L: $y = \frac{1}{3}x + \frac{1}{3}$

[4] 6. Find the equation of the secant line L of the curve $y = x^3 - 2x - 2$ above the interval $[0, 2]$. *(Recall that a secant line to the curve $y = f(x)$ above 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.)*

The secant line passes through $(0, f(0) = -2)$ and also $(2, f(2) = 8 - 4 - 2 = 2)$. Hence his slope $\frac{-2-2}{0-2} = \frac{-4}{-2} = 2$

So $y = 2x + b$

$-2 = 2(0) + b$

$b = -2$

Hence the equation of the secant line is

$$\boxed{y = 2x - 2}$$

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