

Math 1210: Quiz #1

Fall 2017

Name: SOLUTION	A#:	Section: I
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- [4] 1. If $f(x) = \frac{x}{x^2 - 2x + 4}$ and $g(x) = x^2 - 1$ then (do not simplify)

$$f(g(x)) = \frac{(x^2 - 1)}{(x^2 - 1)^2 - 2(x^2 - 1) + 4}$$

$$g(f(x)) = \left(\frac{x}{x^2 - 2x + 4} \right)^2 - 1$$

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

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

- [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 $2x - 4y + 5 = 0$.

The slope of L is $\frac{1}{2}$

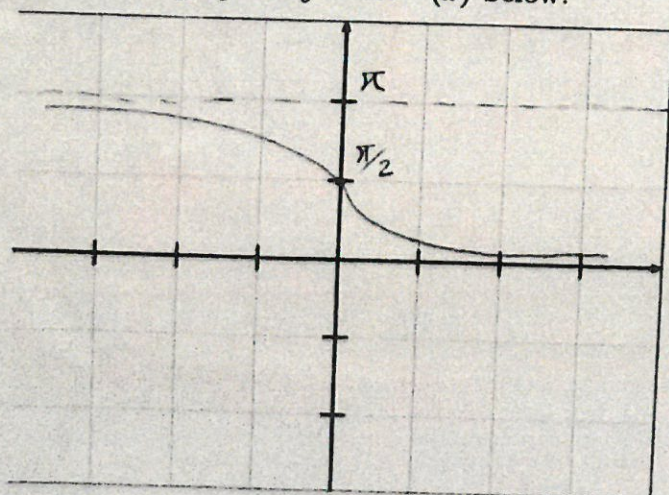
$$y = \frac{1}{2}x + \frac{5}{4}$$

The x -intercept of L is $-\frac{5}{2}$

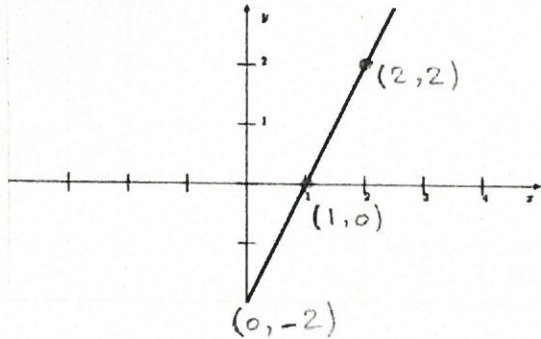
The y -intercept of L is $\frac{5}{4}$

The slope of any line perpendicular to L is -2

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



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



$$m = \frac{2 - 0}{2 - 1} = 2$$

$$y = 2x + b$$

$$0 = 2 + b \rightarrow b = -2$$

OR

$$m = \frac{0 - (-2)}{1 - 0} = 2$$

equation of L : $y = 2x - 2$

OR

$$m = \frac{2 - (-2)}{2 - 0} = \frac{4}{2} = 2$$

- [4] 6. Find the equation of the secant line L of the curve $y = x^3 + 2x + 1$ 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.)

$$x = 0 \rightarrow y = 1$$

$$x = 2 \rightarrow y = 2^3 + 2 \times 2 + 1 = 13$$

$$m_{\text{sec}} = \frac{f(b) - f(a)}{b - a} = \frac{13 - 1}{2 - 0} = \frac{12}{2} = 6$$

$$y = 6x + b \rightarrow 1 = 6 \times 0 + b \Rightarrow b = 1$$

equation: $y = 6x + 1$