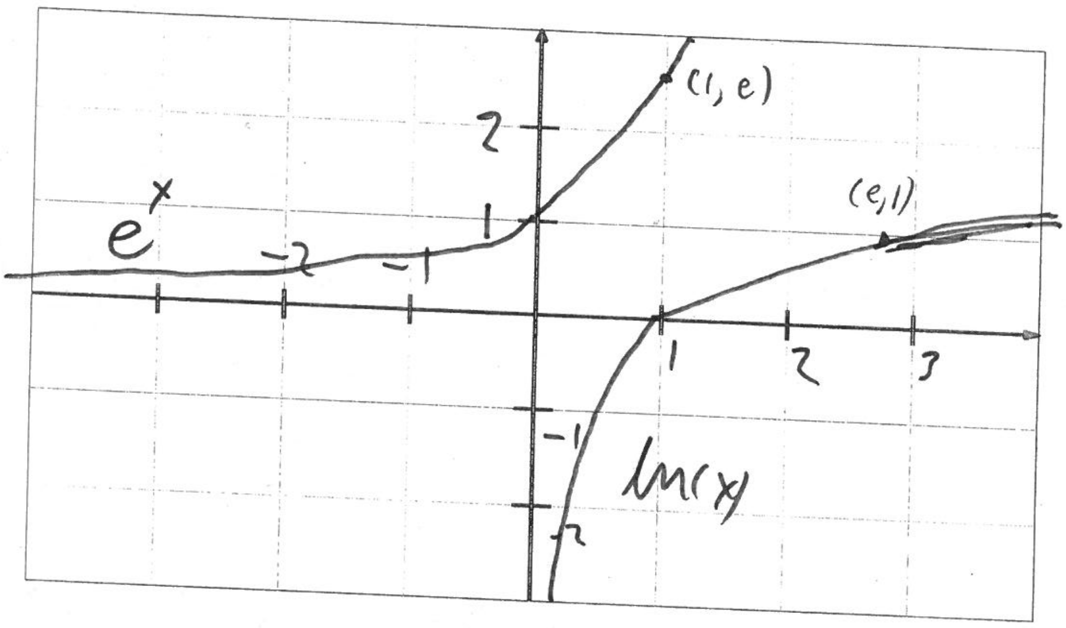
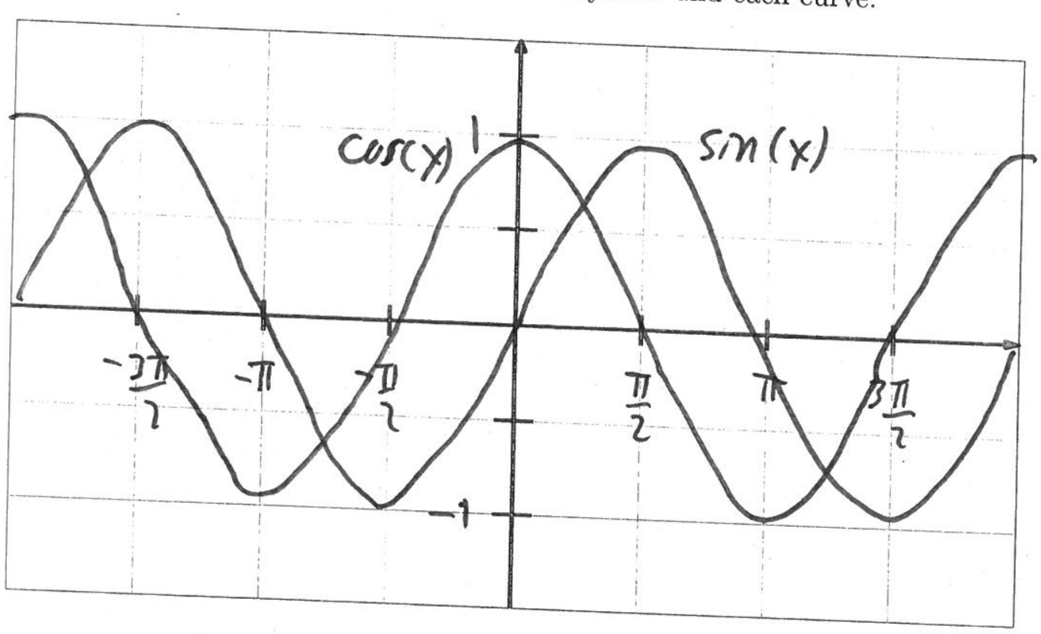
Math 1210: Worksheet #1 **Winter 2017**

Name: ANS C/D	A#:	Section:

[4] 1. In the coordinate system below sketch the graphs of functions $y = e^x$ and $y = \ln(x)$. Make sure that you clearly label the coordinate system and each curve.



[4] 2. In the coordinate system below sketch the graphs of the functions $y = \sin(x)$, $y = \cos(x)$. Make sure that you clearly label the coordinate system and each curve.



[4] 3. Find the equation of the secant line of the curve $y = e^x$ above the interval $[\ln(3), \ln(6)]$. Write the equation in the "slope, y-intercept form" and simplify as much as possible.

$$f(\ln 3) = 3, \quad f(\ln 6) = 6 \Rightarrow m = \frac{6-3}{\ln 6 - \ln 3} = \frac{3}{\ln(2)}$$

$$\Rightarrow b = 3 - \frac{3 \ln 3}{\ln 2}$$

$$y = 3\left(1 + \frac{x - \ln 3}{\ln 2}\right)$$

show-off answer:

$$y = 3\left(1 + \frac{x}{\ln(2)} - \log_2(3)\right)$$

v1.AB

[2] 4. If $f(x) = \ln(x^2 + x + 1)$, $g(x) = e^x$ and $h(x) = x - 1$, then

$(f \circ g \circ h)(x) =$ $\ln\left(e^{2x-2} + e^{x-1} + 1\right)$

[6] 5. Perform the required task and **simplify**.

(a) Write as a sum of summands of the form x^a. $\dfrac{x^2 + \sqrt[5]{x}}{x^3} =$

$$x^{-1} + x^{-\frac{14}{5}}$$

(b) Put on common denominator. $\dfrac{1}{x+2} - \dfrac{2}{x} =$ $\dfrac{x - 2x - 4}{x^2 + 2x} = \boxed{\dfrac{-x-4}{x^2+2x}}$

(c) Expand. $(x^2 + x + 3)(x^2 - 2x + 3) =$ $x^4 - x^3 + 4x^2 - 3x + 9$

(d) Rationalize and cancel if possible. $\dfrac{x+2}{\sqrt{x^2+x+7} - 3} = \dfrac{(x+2)\left(\sqrt{x^2+x+7}+3\right)}{x^2+x+7-9}$

$$= \frac{(x+2)\left(\sqrt{x^2+x+7}+3\right)}{(x+2)(x-1)}$$

$$= \frac{\sqrt{x^2+x+7}+3}{x-1}$$

(e) $\dfrac{(e^x)^{x-1}e^{x-1}}{e^{2-3x}} =$ $\dfrac{e^{x^2-x+x-1}}{e^{2-3x}}$

$$= e^{x^2+3x-3}$$

(f) $\ln(3e^x/5) + \ln(5e^x) - \ln(3e^{x^3}) =$ $\ln\left(\dfrac{3e^x \cdot 5e^x}{5 \cdot 3e^{x^3}}\right)$

$$= \ln\left(e^{2x-x^3}\right)$$

$$= 2x - x^3$$

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