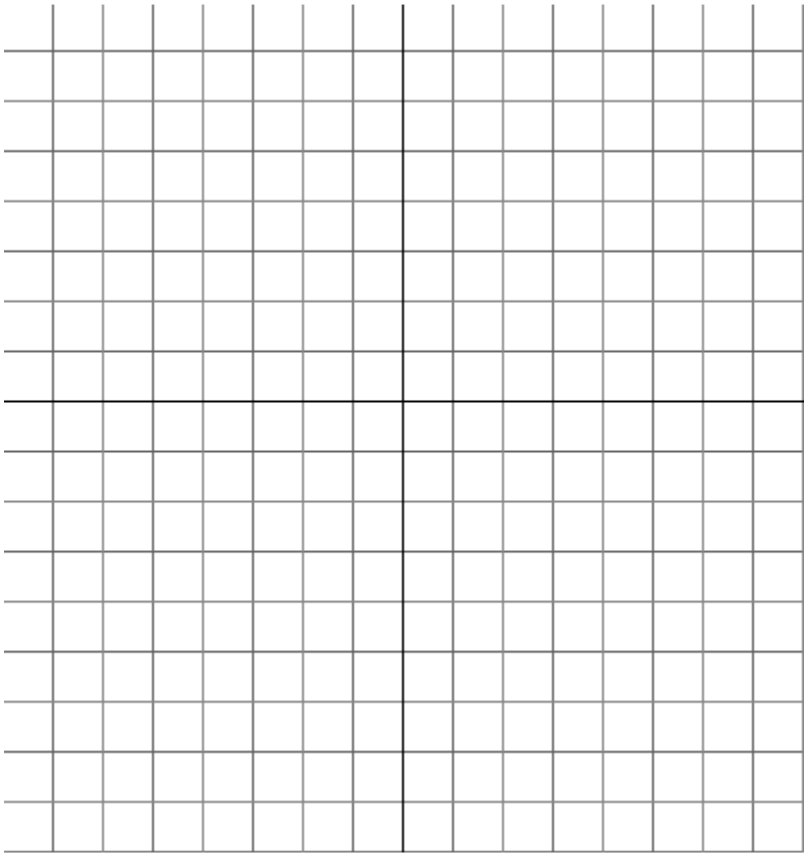
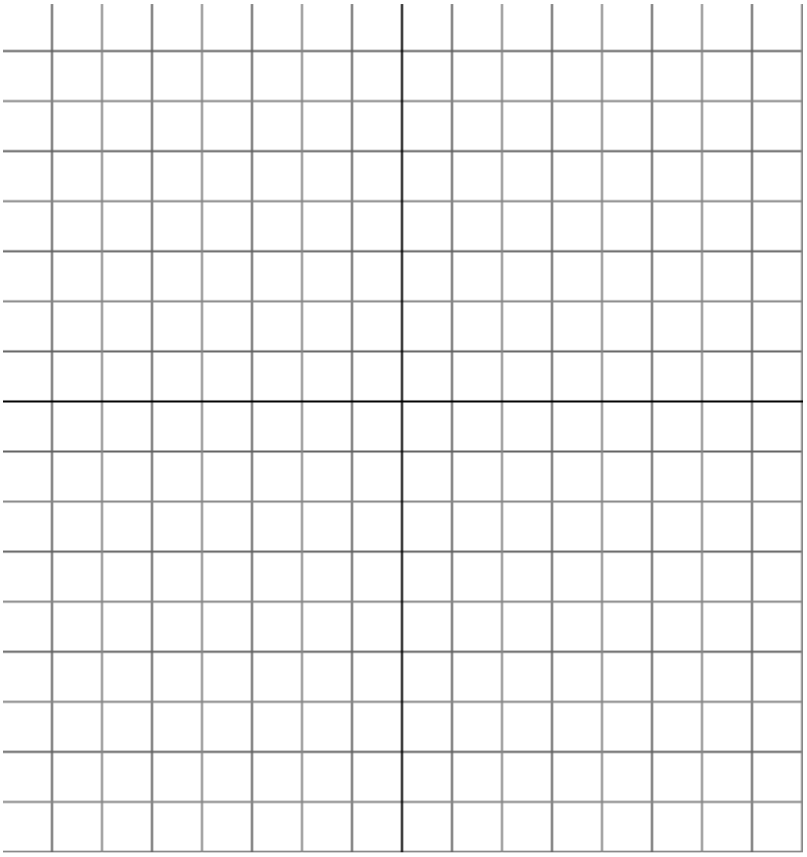
SI Session Exam I Review
February 2nd 12:00 PM – 2:00 PM Rm. 1229
February 5th 5:30 – 7:30 PM, Rm. 1130
February 6th 4:20 – 6:20 PM. Rm. 1229

Prof. Stockton : Calculus II : Spring 2008
SI Leader : Neil Jody

1. Let R denote the region in the xy-plane bounded by the graphs of $y = \ln x$, $y = 1$, and $y = 1 - x$. For each of the following, write down an integral representing the volume of the solid obtained by revolving R about the indicated line:
   (a) the x-axis (b) the y-axis (c) the line $x = -2$
   (d) the line $y = 2$ (e) the line $x = 4$ (f) the line $y = -1$



2. Let C be the portion of the graph of $y = \cos x + 2$ corresponding to $\frac{\pi}{2} \le x \le \pi$. Write down an integral representing each of the following:
   (a) the area of the surface obtained by revolving C about the x-axis
   (b) the area of the surface obtained by revolving C about the y-axis
   (c) the area of the surface obtained by revolving C about the line $x = 4$
   (d) the area of the surface obtained by revolving C about the line $y = 3$
   (e) the area of the surface obtained by revolving C about the line $x = -2$
   (f) the area of the surface obtained by revolving C about the line $y = -1$



3. Write the following in algebraic form.

   (a) $\sec\left(\tan^{-1}(4x)\right)$

   (b) $\cos\left(\cot^{-1}(x)\right)$

   (c) (c) $\sec\left[\sin^{-1}(x-1)\right]$

4. Without using a calculator, find the exact value of $\sin\left(2\arccos\left(-\frac{4}{5}\right)\right)$.

5. $\frac{d}{dx}\left[y = \frac{1}{\tan^{-1} x} \right]$

$\frac{d}{dx}\left[y = \csc^{-1}\left(e^{x}\right) \right]$

$\frac{d}{dx}\left[y = x^{2}\left(\sin^{-1} x\right)^{3} \right]$

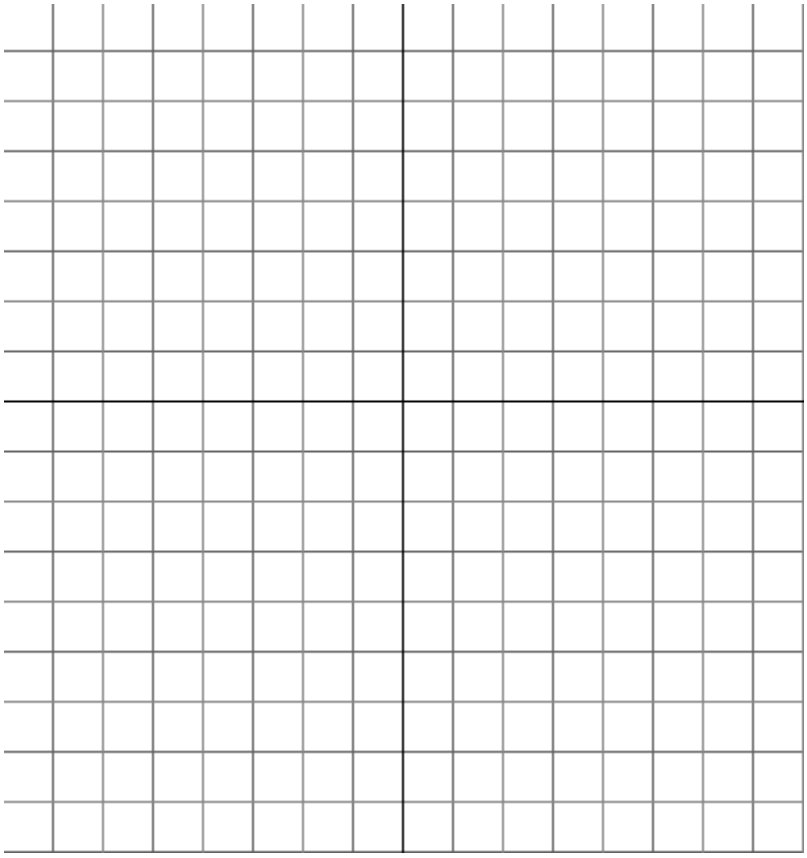
6. $\int \frac{1}{x\sqrt{1-\left(\ln x\right)^{2}}}\, dx$

$\int \frac{1}{\sqrt{16-6x-x^{2}}}\, dx$

$\int \frac{e^{2x}}{\sqrt{25-e^{2x}}}\, dx$

$\int \frac{4x+5}{x^{2}-4x+5}\, dx$

7. Write a definite integral that represents the Area between the given curves.



$y = e^x,\ y = e^{2x},\ x = 0,\ x = \ln 2$

8. Find the (arc) length of the curves.

The portion of the graph of $y = \frac{x^3}{12} + \frac{1}{x}$ from $x = 1$ to $x = 2$

The portion of the graph of $f(x) = 3x^{2/3} - 10$ from (8,2) to (27,17)