

Your Name

Your Signature

Student ID #

--	--	--	--	--	--	--

Circle quiz section and print TA's name:

EA EB EC ED FA FB FC FD

- Turn off all cell phones, pagers, radios, mp3 players, and other similar devices.
- This exam is closed book. You may use one $8\frac{1}{2}'' \times 11''$ sheet of handwritten notes (both sides).
- You can use only Texas Instruments TI-30X calculator.
- Give your answers in exact form, not decimals, unless instructed otherwise.
- In order to receive credit, you must **show all of your work**. If you do not indicate the way in which you solved a problem, you may get little or no credit for it, even if your answer is correct.
- **Check your work carefully**. We will award only limited partial credit.
- Place

a box around your answer

 to each question.
- If you need more room, use the backs of the pages and indicate that you have done so.
- Raise your hand if you have a question.
- This exam has 6 pages, plus this cover sheet. Make sure that your exam is complete.

Question	Points	Score
1	10	
2	10	
3	20	
4	10	
5	10	
6	10	
Total	70	

-
1. (10 points) Estimate the area under the graph of the function $f(x) = \sqrt{x}(\ln x)^2$ between $x = 1$ and $x = 4$. Use a Riemann sum with 4 subintervals. Use the left point rule. Give your answer as a decimal number with 4 significant digits.

2. (10 points) Find the total (unsigned) area between the graphs of $f(x) = (2/\pi)^3 x^3$ and $g(x) = \sin x$. Give the answer in exact form.

Hint: Sketch the graphs of the functions. Find x such that $f(x) = 1$.

3. Compute the following integrals. In part (a), give the answer in the decimal form with at least three significant digits.

(a) (10 points) $\int_2^3 \frac{1}{x^2} \tan\left(\frac{x+1}{x}\right) dx$

(b) (10 points) $\int \csc^2 z (\cot z + \sin^2 z) dz$

4. (10 points) Find $f'(\pi/4)$ if

$$f(x) = \int_{\sin x}^{\cos x} (s^2 + s) ds.$$

Give your answer in exact simplified form.

5. (10 points) An object was thrown up from the ground level. It reached the highest point on its trajectory after 3 seconds.

(i) What was the initial upward velocity?

(ii) How high above the ground was the highest point on the trajectory?

Use the metric system. Assume that the gravitational acceleration is -9.8m/sec^2 . Give your answers as decimal numbers with 3 significant digits.

6. (10 points) Consider the region A above the x -axis, below the graph of $y = \frac{1}{x}e^x \sin(e^x)$, between $x = \ln(\pi/2)$ and $x = \ln \pi$. Compute the volume of the solid of revolution obtained by rotating the region A about the y -axis. Do not compute the area of the region A . Give the answer in exact form.