

College of the Holy Cross, Spring 2018
Math 134 Midterm Exam 2
Friday, March 16

Your Name: _____

Instructions: For full credit, you must show *all work* on the test pages and place your final answer in the box provided for the problem. Use the back of the preceding page if you need more space for scratch work. The numbers next to each part of the questions are their point values. The following power sum formulae may be useful:

Please do not write in the space below

Problem	Points/Poss
I	/ 40
II	/ 45
III	/ 15
Total	/100

I. All parts of this problem refer to the region R bounded by $y = x$, $y = x^2 + 1$, $x = 0$ and $x = 2$.

A. (10) Sketch the region R .

B. (10) Compute the area of the region R .

Area =

- C. (10) Compute the volume of the solid of revolution obtained by rotating the region R about the x -axis.

Volume =

- D. (10) Compute the volume of the solid of revolution obtained by rotating the region R about the line $x = -2$. (Note: Any correct method is OK here.)

Volume =

II. Compute each of the following integrals by an appropriate method (e.g. u -substitution, parts, etc.)

A. (15) $\int x^2 \cos(5x^3) dx$

Integral =

B. (15) $\int x^2 \cos(5x) dx$

Integral =

C. (15) $\int e^{\sqrt{x}} dx$ (Hint: Let $u = x^{1/2}$.)

III.

- A. (10) Identify a u and a dv , then carry out an integration by parts to derive the following reduction formula for exponents $k \geq 1$.

$$\int (\ln(x))^k dx = x(\ln(x))^k - k \int (\ln(x))^{k-1} dx$$

- B. (5) Apply the formula in part A to integrate $\int (\ln(x))^2 dx$. (Note: You can do this part even if you didn't see how to finish part A.)

Integral =