

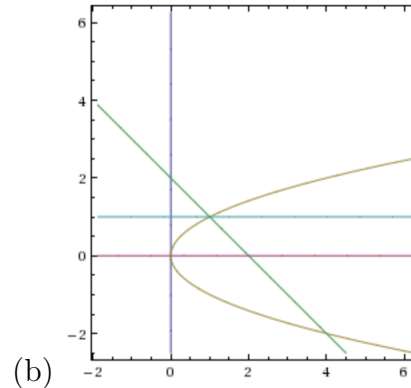
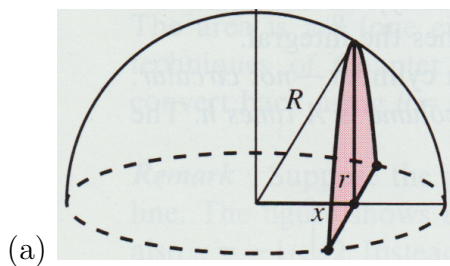
# Calculus II (Math 232) Exam 1

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Justify answers and show all work for full credit.

NAME: \_\_\_\_\_



1. Use calculus to compute the volume of a sphere with radius  $R$ . See Figure (a).
2. Use the shell method to find the volume of the solid generated by revolving about the  $y$ -axis the region bounded by  $y = e^x$ ,  $y = 0$ ,  $x = 0$ , and  $x = 1$ .
3. Find the volume of the solid by rotating the region bounded by  $x = y^2$  and  $y = -x + 2$  about the line  $y = 1$ . See Figure (b).
4. Find the volume of the solid by rotating the region bounded by  $x = y^2$  and  $y = -x + 2$  about the line  $x = 4$ . See Figure (b). Set up the integral, but do not integrate.

Evaluate the following integrals. Make sure your final answers are only in terms of  $x$ . Show all work for full credit!

5.  $\int \frac{1}{x \sqrt[3]{\ln x}} dx$

6.  $\int \cos^2(18x) dx$

7.  $\int x^2 \sin(3x) dx$

8.  $\int \sqrt{1 - 9x^2} dx$

9.  $\int_0^3 2x e^{6x} dx$

10.  $\int \frac{x^2 + 8x - 15}{x^3 - 5x^2} dx$

11.  $\int \cos^3(4x) dx$

12.  $\int \frac{2x^3 + 32x + 3}{x^2 + 16} dx$