

PROBLEM 1, MIDTERM 1 - SOLUTION

Volume of the solid obtained by revolving the region  $R$  between the graph of  $f$  and the  $x$  axis on interval  $[a, b]$  is given by the formula:

$$V = \int_a^b \pi(f(x))^2 dx.$$

For  $f(x) = \frac{1}{\sqrt{x}}$  and  $a = 1, b = 2$ , we get

$$V = \int_1^2 \pi \frac{1}{x} dx = \pi \ln(2) - \pi \ln(1) = \pi \ln(2),$$

since  $\ln(1) = 0$ .

20 points. NO PARTIAL CREDIT for this problem.