

Homework 3 and 4: Math 15200

1. (10 points) **Due February 11.** Define a function $A(x) = \int_1^x \frac{\ln(t) dt}{t^2 + 1}$. Prove that

$$A\left(\frac{1}{x}\right) = A(x).$$

2. (10 points) **Due February 15.** Find the volume of the solid obtained by revolving the region bounded by $y = 1 - x^2$ and $y = 2x$ about the x -axis.

Hint: Note that this region does not lie completely above or below the x -axis, so there will be some overlap. Instead of directly using the washer method, try determining what the cross-sections look like.