MATH 212 Quiz 1 NAME:

1. Evaluate $\int \frac{(\ln x)^2}{x}\,dx$.
2. Find the volume of the solid obtained by rotating the region bounded by $y = \sqrt{x-1}$, $x = 2$, $x = 5$ about the x-axis.

Solutions

Sol. 1 Let $u = \ln x$ so that $du = \frac{1}{x}dx$. Then $\int \frac{(\ln x)^2}{x}\,dx = \int u^2 du = \frac{u^3}{3} + C = \frac{\ln^3 x}{3} + C$.

Sol. 2 Volume $= \int_2^5 \pi(\sqrt{x-1})^2 dx = \frac{x^2}{2} - x|_2^5 = \frac{15}{2}$.