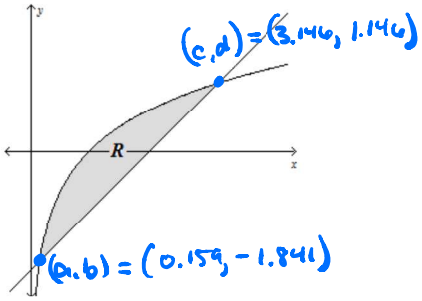
Name **Date** **Class**

Homework 7.8

Let R be the region bounded by the graphs of $y = \ln x$ and the line $y = x - 2$ as shown. Though you may use a calculator, show the integral that you found to arrive at your answer.



1. Find the volume of the solid whose base is region R that is formed by cross sections that are semi-circles that are perpendicular to the x – axis.

$$V = \frac{1}{8}\pi \int_a^c [\ln x - (x-2)]^2 dx$$

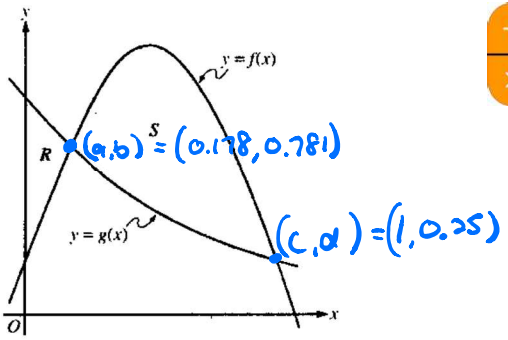
$$V = 0.607$$

2. Find the volume of the solid whose base is region R that is formed by cross sections that are squares that are perpendicular to the x – axis.

$$V = \int_a^c [\ln x - (x-2)]^2 dx$$

$$V = 1.545$$

Let f and g be the functions given by $f(x) = \frac{1}{4} + \sin(\pi x)$ and $g(x) = 4^{-x}$. Let R be the region in the first quadrant enclosed by the y-axis and the graphs of f and g, and let S be the region in the first quadrant enclosed by the graphs of f and g shown. Though you may use a calculator, show the integral that you found to arrive at your answer.



3. Find the volume of the solid whose base is the cross section area of region S and is formed by squares that are perpendicular to the x-axis.

$$V = \int_a^c [f(x) - g(x)]^2 dx$$

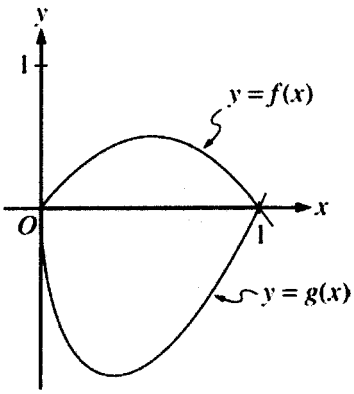
$$V = 0.250$$

4. Find the volume of the solid whose base is the cross section area of region S and is formed by equilateral triangles that are perpendicular to the x – axis.

$$V = \frac{\sqrt{3}}{4} \int_a^c [f(x) - g(x)]^2 dx$$

$$V = 0.108$$

Let f and g be the functions given by $f(x) = 2x(1-x)$ and $g(x) = 3(x-1)\sqrt{x}$ for $0 \le x \le 1$. The graphs of f and g are shown in the figure. Though you may use a calculator, show the integral that you found to arrive at your answer.



5. Find the volume of the solid whose base is the cross section of the region bounded by the graphs of f and g and is formed by squares that are perpendicular to the x-axis.

$$V = \int_0^1 [f(x) - g(x)]^2 \, dx$$

$$V = 1.493$$

6. Find the volume of the solid whose base is the cross section of the region bounded by the graphs of f and g and is formed by semi-circles that are perpendicular to the x-axis.

$$V = \frac{1}{8}\pi \int_0^1 [f(x) - g(x)]^2 \, dx$$

$$V = 0.586$$

7. Find the volume of the solid whose base is the cross section of the region bounded by the graphs of f and g and is formed by equilateral triangles that are perpendicular to the x-axis.

$$V = \frac{\sqrt{3}}{4} \int_0^1 [f(x) - g(x)]^2 \, dx$$

$$V = 0.646$$

8. Find the volume of the solid whose base is the cross section of the region bounded by the graphs of f and g and is formed by right isosceles triangles that are perpendicular to the x-axis.

$$V = \frac{1}{2} \int_0^1 [f(x) - g(x)] \, dx$$

$$V = 0.746$$