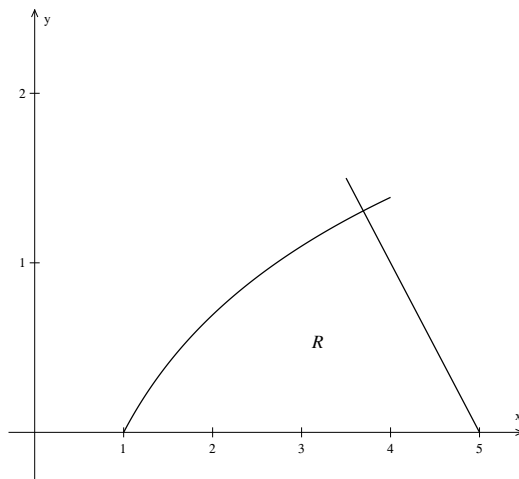


You *MAY* use a calculator.



Let R be the region in the first quadrant bounded by the x -axis and the graphs of $y = \ln x$ and $y = 5 - x$, as shown in the figure above.

- (a) Find the area of region R .

-
- (b) Region R is the base of a solid. For the solid, each cross section perpendicular to the x -axis is a square. Write, but do not evaluate, an expression involving one or more integrals that gives the volume of the solid.

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- (c) The horizontal line $y = k$ divides R in two regions of equal area. Write, but do not solve, an equation involving one or more integrals whose solution gives the value of k .