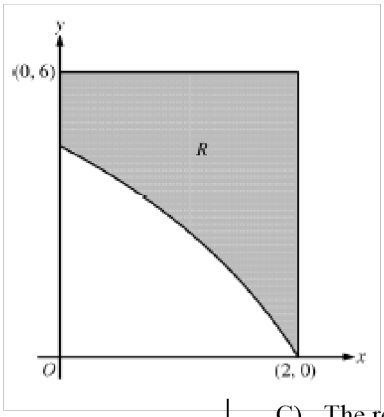
CALCULATOR PERMITTED
2010 AP© Calculus AB (Form B)
Question 1

In the figure, R is the shaded region in the first quadrant bounded by the graph of $y = 4\ ln\ (3 - x)$, the horizontal line $y = 6$, and the vertical line $x = 2$.



A) Find the area of R

$Area = \int_0^2 [6 - 4\ln(3-x)]\,dx$ +1

$Area = 6.817$ +1

B) Find the volume of the solid generated when R is revolved about the horizontal line y = 8.

$V = \pi \int_0^2 [(8 - 4\ln(3-x))^2 - (8-6)^2]\,dx$ +2

$= 53.533\pi$

$= 168.179$ +1

C) The region R is the base of a solid. For this solid, each cross section perpendicular to the x-axis is a square. Find the volume of the solid.

$V = \int_0^2 [6 - 4\ln(3-x)]^2\,dx$ +2

$V = 26.267$ +1

+1 Correct limits in (a), (b), and (c)