

1990 AB 3

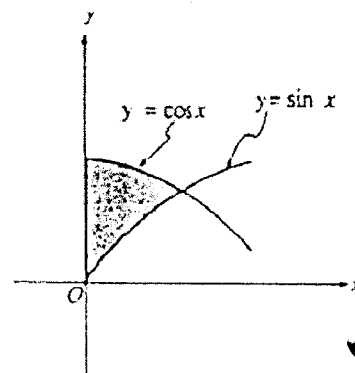
Let R be the region enclosed by the graphs of $y = e^x$, $y = (x-1)^2$, and the line $x = 1$.

- Find the area of R .
- Find the volume of the solid generated when R is revolved about the x -axis.
- Set up, but do not integrate, an integral expression in terms of a single variable for the volume of the solid generated when R is revolved about the y -axis.

1991 BC 3

Let R be the shaded region in the first quadrant enclosed by the y -axis and the graphs of $y = \sin x$ and $y = \cos x$, as shown in the figure above.

- Find the area of R .
- Find the volume of the solid generated when R is revolved about the x -axis.
- Find the volume of the solid whose base is R and whose cross sections cut by planes perpendicular to the x -axis are squares.



2006 AB 1

Let R be the shaded region bounded by the graph of $y = \ln x$ and the line $y = x - 2$, as shown above.

- Find the area of R .
- Find the volume of the solid generated when R is rotated about the horizontal line $y = -3$.
- Write, but do not evaluate, an integral expression that can be used to find the volume of the solid generated when R is rotated about the y -axis.

a) $\int_{0.159}^{3.146} (\ln x - (x-2)) dx = 1.949$

b) washer $V = \pi \int_{0.159}^{3.146} [(3 + \ln x)^2 - (3 + x - 2)^2] dx$
 10.886π OR 34.199

16 c) washer $V = \pi \int_{-1.841}^{1.146} [(y+2)^2 - (e^y)^2] dy$

