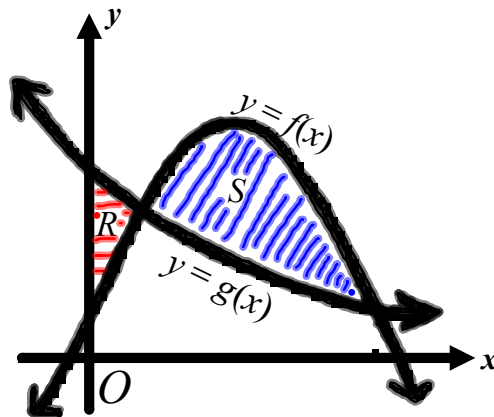AP Test Question
2005
Part A - With Calculator

1) Let f and g be functions given by $f(x) = \frac{1}{4} + \sin(\pi x)$ and $g(x) = 4^{-x}$. Let R be the shaded region in the first quadrant enclosed by the y-axis and the graphs of f and g, and let S be the shaded region in the first quadrant enclosed by the graphs of f and g, as shown in the figure above.

    a) Find the area of R.

    b) Find the area of S.

    c) Find the volume of the solid generated when S is revolved around the horizontal line $y = -1$.