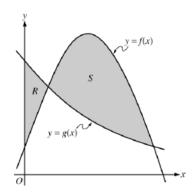
2005 BC1



- 1. 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 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.
- a) Find the area of R.
- b) Find the area of S.
- c) Region S 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.

- d) Find the volume of the solid generated when S is revolved about the horizontal line y = -1.
- e) Find the perimeter of the region S.