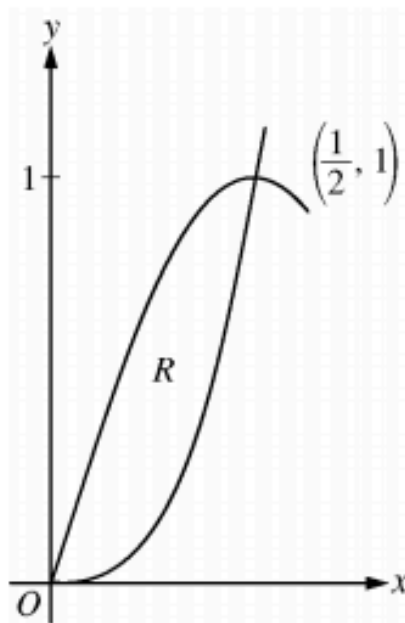


**CALCULUS AB**  
**SECTION II, Part B**  
Time—60 minutes  
Number of problems—4

**No calculator is allowed for these problems.**



3. Let  $R$  be the region in the first quadrant enclosed by the graphs of  $f(x) = 8x^3$  and  $g(x) = \sin(\pi x)$ , as shown in the figure above.
- Write an equation for the line tangent to the graph of  $f$  at  $x = \frac{1}{2}$ .
  - Find the area of  $R$ .
  - Write, but do not evaluate, an integral expression for the volume of the solid generated when  $R$  is rotated about the horizontal line  $y = 1$ .