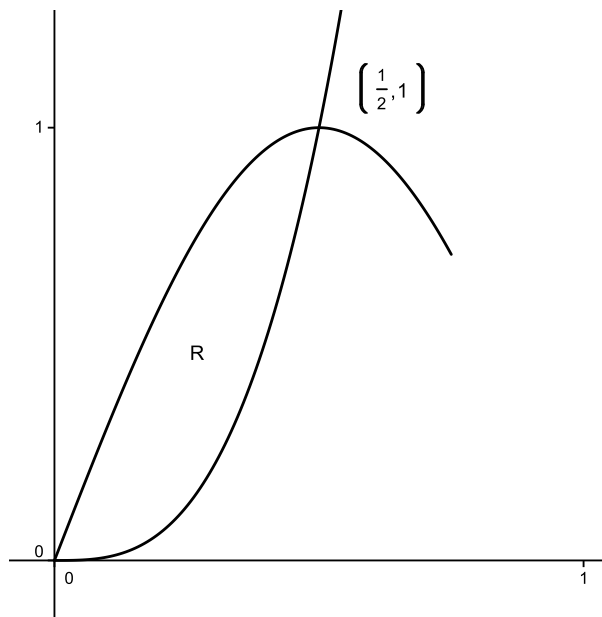You *MAY NOT* use a calculator.

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.

(a) Write an equation for the line tangent to the graph of f at $x = \dfrac{1}{2}$.

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(b) Find the area of R.

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(c) Write, but do not evaluate an integral expression for the volume of the solid generated when R is rotated about the horizontal line $y = 1$.