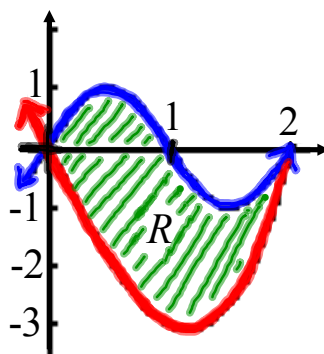


AP Test Question
2008
Part A - With Calculator



- 1) Let R be the region bounded by the graphs of $y = \sin(\pi x)$ and $y = x^3 - 4x$, as shown in the figure above.
 - a) Find the area of R .
 - b) The horizontal line $y = -2$ splits the region R into two parts. Write, but do not evaluate, an integral expression for the area of the part of R that is below this horizontal line.
 - c) The region R is the base of a solid. For this solid, each cross section perpendicular to the x -axis is a square. Find the volume of this solid.
 - d) The region R models the surface of a small pond. At all points in R at a distance x from the y -axis, the depth of the water is give by $h(x) = 3 - x$. Find the volume of water in the pond.