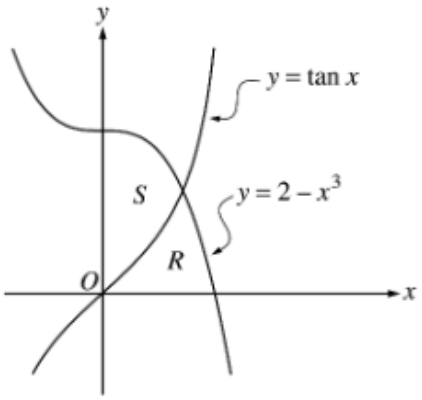
Name:_____
AP Calculus
Applications of Integration Review



Let R and S be the regions in the first quadrant shown in the figure above. The region R is bounded by the x-axis and the graphs of $y = 2 - x^3$ and $y = \tan x$. The region S is bounded by the y-axis and the graphs of $y = 2 - x^3$ and $y = \tan x$.

For each problem below, determine the answer for:

(a) Region R
(b) Region S

(1) Find the area.

(2) Find the volume when the region is rotated around the *x*-axis.

(3) Find the volume when the region is rotated around the *y*-axis.

(4) Find the volume when the region is rotated around the line $y = 10$.

(5) Find the volume when the region is rotated around the line $x = -2$.

(6) Find the volume with cross sections perpendicular to the *x*-axis using equilateral triangles (Region R only) and semicircles (Region S only).

(7) Determine the perimeter of the bounded region.