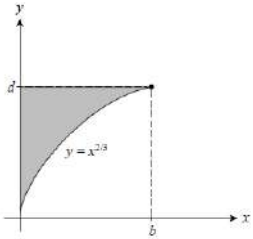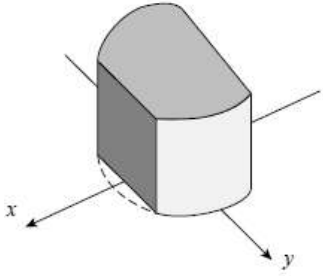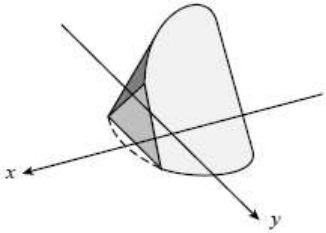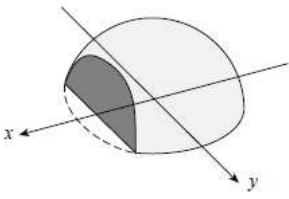# AP Calculus - Area & Volumes - Practice #2

1.) Let R be the region bound by the graphs of $f(x) = \sin(x)$ and $g(x) = x^3 - 4x$ as shown in the figure above.

  a. Find the area of R
  b. Find the volume of the solid generated when the region R is revolved around the horizontal line $y = 2$
  c. What is the greatest vertical distance between f and g? Justify your answer.
  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 given by $h(x) = 3 - x$. Find the volume of water in the pond.

2.) Find the volume of solid formed by revolving the region between $y = x^{\frac{2}{3}}$ and x = 0 and y = 1.25147 about the y-axis.

3.) A solid whose base is bounded by the circle $x^2 + y^2 = 4$ is formed with cross sections taken perpendicular to the x-axis.   Find the volume if the cross sections are:

  a) Squares.
  b) Equilateral triangles.
  c) Semicircles
  d) Isosceles right triangles

a.)

b.)

c.)

d.)