Present neatly on separate paper. Justify for full credit. No Calculators.
Name _____Score _____ 30 minutes **Weight: x5**

1) Each integral represents the volume of a solid. Describe the solid in as much detail as possible!

 a)

$$\int_0^\pi \pi(2 - \sin x)^2 \, dx$$

 b)

$$\int_0^4 2\pi(6 - y)(4y - y^2) \, dy$$

2) The base of a solid is a circular disk with radius 3. Find the volume of the solid if parallel cross-sections perpendicular to the base are isosceles right triangles with hypotenuse lying along the base.

3) Find the area of the region bounded by the given curves.

$$x + y = 0, \quad x = y^2 + 3y$$

4) Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified axis.

$$y = x^2 + 1, \ y = 9 - x^2; \quad \text{about } y = -1$$