

Name:

Perm number:

**Test 2**

Time: 75 minutes

1. Find the area bounded between the curves  $y = x^3 + 1$  and  $y = x + 1$ .

2. Find the volume of the solid of revolution obtained by rotating the region bounded between the curves  $y = x^2$  and  $x = y^2$  about the  $y$ -axis.

3. An aquarium 2  $m$  long, 1  $m$  wide, and 1  $m$  deep is full of water. Find the work needed to pump half of the water out of the aquarium (recall that the density of water is  $1000 \text{ kg/m}^3$ )

4. Find the average value of  $f(x) = (x - 3)^2$  on the interval  $[2, 5]$ . Find  $c$  such that  $f(c)$  is equal to the average value you just found.