Math 142 Quiz 5
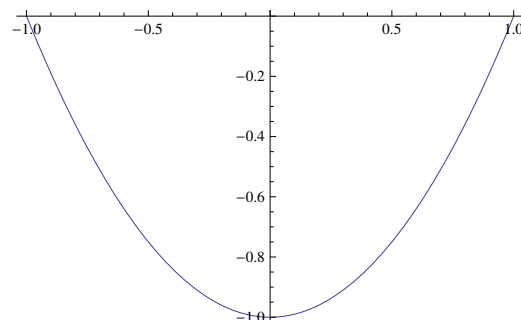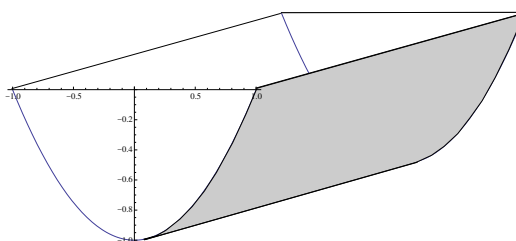
Names: _____

1. Find the center of mass for a flat, uniformly dense object in the shape of the graph of $x^2 - 1$ on $[-1, 1]$.

2. A basin full of water has a length of 5 meters and a cross section given by the graph of $x^2 - 1$ on $[-1, 1]$. Using the answer from question 1, find the work needed to pump all of the water out of the basin.

3. Pappus' theorem says that the volume of a solid formed by rotating an area around a line is the product of the area and the distance traveled by the center of mass. Using to find the volume of the solid created when the graph of $x^2 - 1$ on $[-1, 1]$ is spun around

    a. The x-axis.

    b. The line $x = 2$.

    c. The line $y = -1$.

    d. The line $y = x + 1$.