Name: _____

TEST 1

February 13, 2025

MATH 201

R. Hammack

1. Find the area of the region contained between the graphs of $y = \dfrac{2}{1+x^2}$ and $y = 1$.

2. Consider the region contained between the graphs of $y = x^3 - 2x^2 + x$ and $y = 0$.
This region is revolved around the y-axis. Find the volume of the resulting solid.

3. Consider the region contained between the y-axis and the curve $x = y - y^2$.
This region is revolved around the y-axis. What is the volume of the resulting solid?

4. Find the area of the surface obtained by rotating $y = 2\sqrt{x}$ for $0 \leq x \leq 3$ around the x-axis.

5. Find the arc length of the curve $y = \int_0^x \sqrt{t^2 + 2t}\, dt$ from $x = 2$ to $x = 4$.

6. A cylindrical tank, filled with water, is 1 meter high, and has a radius of 1 meter. Calculate the work required to pump all the water to the top of the tank. (Recall that the density of water is 1000 kilograms per cubic meter, and the acceleration due to gravity is 9.8 meters per second per second.)