172 Homework 7 Name: ______________________________

Set up the integrals to compute each arc length. For the first one, compute the integral by hand. You may learn something. For the second two, use wolfram to get a numeric answer.

1. Find the arc length of the curve $y = \sqrt{1 - x^2}$ from $x = 0$ to $x = 1$

2. Find the arc length of the curve $y = x^3 - 2x$ from $x = 0$ to $x = 2$

3. Find the arc length of $y = \sin(x)$ from $x = 0$ to $x = \pi$

Find each surface area. Again, do the first one by hand and use wolfram for the second rest.

1. Find the area of the surface obtained by rotating $y = \sqrt{a^2 - x^2}$ from $x = -a$ to $x = a$ about the x axis

2. Find area of the surface obtained by rotating $y = \cos(x)$ from $-\frac{\pi}{2}$ to $\frac{\pi}{2}$ about the x axis.

3. Find the area of the surface obtained by rotating $x = y + y^3$ for $0 < y < 1$ about the x axis.

4. Find the area of the surface obtained by rotating $x = y + y^3$ for $0 < y < 1$ about the y axis.

5. Find the area of the surface obtained by rotating $\ln(y) = x - y^2$ for $1 < y < 4$ about the x axis.