

Name: _____

Worksheet #23

Math 221

Instructions. Put the your first and last name at the top of your paper. Everyone is to do their own worksheet but only one from each group is graded with the score shared. Be sure to **explain your reasoning**.

1. Calculate the following definite integrals.

$$(a) \int_0^{\frac{\pi}{2}} \frac{\sin(x) \cos(x)}{\sqrt{1 - \sin x}} dx$$

$$(b) \int_0^{\frac{\pi}{4}} \tan x dx$$

$$(c) \int_0^4 x^3 \sqrt{x^2 + 2} dx$$

2. Write an integral for the area bounded by $y = x + 1$ and $y = x^2 - 1$.

3. Consider the region bounded by $y = 4\sqrt{x}$ and $y = \frac{x^2}{2}$. Write two integrals, one with respect to x and the other to y , that express the area of this region.

4. Write an integral for the area bounded by $y = \sin x$ and $y = \cos x$ from $\frac{\pi}{4}$ to $\frac{5\pi}{4}$.