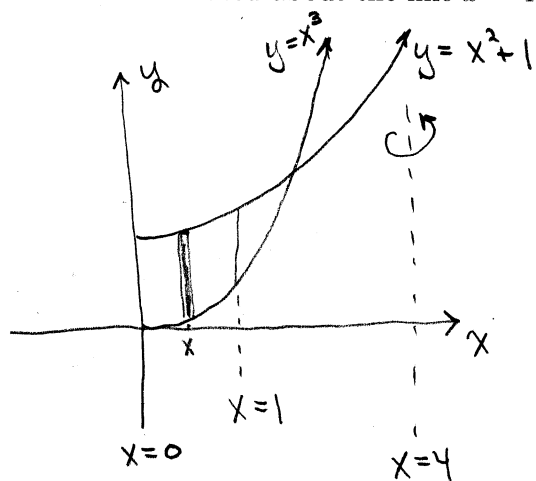# Math 172 - Quiz 7

October 12, 2016

Name _____key_____

Score _____

Show all work to receive full credit. Supply explanations when necessary. Set up the definite integral required for each problem. Then use your calculator to approximate its value.

1. (5 points) The region bounded by the graphs of $y = x^2 + 1$, $y = x^3$, $x = 0$, and $x = 1$ is rotated about the line $x = 4$ to generate a solid. Find the volume of the solid.

SHELLS ....

$$\text{Volume} = 2\pi \int_0^1 (4-x)(x^2+1-x^3)\, dx$$

$$\approx 23.77$$

2. (5 points) Find the length of the graph of the function $f(x) = x \sin x$ over the interval from $x = 0$ to $x = 5$.

$$f'(x) = x \cos x + \sin x$$

$$\text{Arc Length} = \int_0^5 \sqrt{1 + (x \cos x + \sin x)^2}\, dx$$

$$\approx 10.35$$