PROBLEMS FOR 6.2 (20 points) NAME _____

Use the disks and washers method. SHOW AND ATTACH ALL WORK and give **EXACT ANSWERS**. Make an appropriate sketch, set up one or more appropriate definite integral, and then show the correct integration. Use a graphing calculator to verify your answer (if you wish). (5 points each)

1. Find the volume of the solid formed when the region enclosed by $x = 2y^2 + 3$, $x = 0$, $y = 0$, and $y = 2$ is rotated around the ***x*-axis**.

2. Find the volume of the solid formed when the region enclosed by $x = 2y^2 + 3$, $x = 0$, $y = 0$, and $y = 2$ is rotated around the ***y*-axis**.

3. Find the volume of the solid formed when the region enclosed by $3x - y = 36$, $3x - 4y = 18$, and $y = -3$ is rotated about the line $x = -1$.

4. Find the volume of the solid formed when the region enclosed by $y = \tan x$, $y = 0$, and $x = \frac{\pi}{3}$ is rotated around the *x*-axis.

JUST FOR FUN(DAMENTAL THEOREM OF CALCULUS): Keeping in mind that $\int_a^b f(x)\,dx = F(b) - F(a)$ where $F'(x) = f(x)$, find $f(4)$ (exact value) for each of the following situations: (1 point of extra credit for each problem in which both correct work and correct answer are given)

a) $\int_0^x f(t)dt = x\cos\pi x$

b) $\int_0^{f(x)} t^2 dt = x\cos\pi x$

c) $\int_0^{x^2} f(t)dt = x\cos\pi x$