Instructor: Sal Barone

Name: _____

GT username: _____

1. No books or notes are allowed.

2. You may use ONLY NON-GRAPHING and NON-PROGRAMABLE scientific calcu-lators. All other electronic devices are not allowed.

3. Show all work and fully justify your answer to receive full credit.

4. Please ⌐BOX¬ your answers.

5. Good luck!

Page	Max. Possible	Points
1	30	
2	30	
3	20	
4	20	
Total	100	

1. During an experiment the velocity of a particle at time t is given by   (15 pts.)

$$v(t) = \frac{3t}{(1+t^2)^2}$$

for $t > 0$. How far has the particle travelled in the first 2 seconds of the experiment?

2. Solve the separable differential equation.   (15 pts.)

$$\frac{dy}{dx} = x^2\sqrt{y}, \quad y > 0.$$

3. Find the value of the definite intergral. *Hint: try integration by parts.* (15 pts.)

$$\int_1^e x^3 \ln(x) \, dx$$

4. Find the area bounded by the two curves $y = x^3 - 2x^2 + 1$ and $y = 3x + 1$. (15 pts.)

5. Integrate using any method. (10 pts. each)

(a) $\displaystyle \int \tan(3x)\, dx$

(b) $\displaystyle \int \left(4x - 3 + \sec^2(x)\right) dx$

6. Find the value. (10 pts. each)

7. $\displaystyle\int_0^{\pi/4} \sec(x)\, dx$

8. $\displaystyle\int_0^1 \frac{1}{\sqrt{1-x^2}}\, dx$