Math 1552
Spring 2019
Quiz 3 6:00
January 31, 2019
Time Limit: 15 Minutes

Name (Print): _____

Canvas email: _____

Teaching Assistant/Section: _____

GT ID:

By signing here, you agree to abide by the **Georgia Tech Honor Code**: *I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech Community.*

Sign Your Name: _____

This quiz contains 2 pages (including this cover page) and 2 problems. Check to see if any pages are missing. Enter all requested information on the top of this page.

You may *not* use your books, notes, or any calculator on this quiz.

You are required to show your work on each problem on this quiz. The following rules apply:

- **If you use a "fundamental theorem" you must indicate this** and explain why the theorem may be applied.
- **Organize your work**, in a reasonably neat and coherent way, in the space provided. Work scattered all over the page without a clear ordering will receive very little credit.
- **Mysterious or unsupported answers will not receive full credit**. A correct answer, unsupported by calculations, explanation, or algebraic work will receive no credit; an incorrect answer supported by substantially correct calculations and explanations might still receive partial credit.
- Please circle or box in your final answer.

Problem	Points	Score
1	12	
2	8	
Total:	20	

1. (12 points) Evaluate the following indefinite integral

$$\int \frac{\tan^{-1}\left(\frac{x}{5}\right)}{25+x^2}\,dx$$

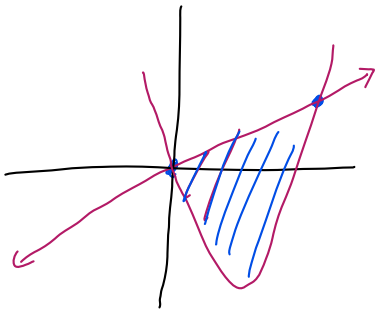
$u = \tan^{-1}\left(\frac{x}{5}\right)$ +2

$du = \frac{1}{1+\left(\frac{x}{5}\right)^2}\cdot\frac{1}{5}\,dx = \frac{dx}{5+\frac{x^2}{5}} = \frac{5\,dx}{25+x^2}$ +2

$= \int \frac{1}{5}u\,du$ +2 $= \frac{1}{5}\cdot\frac{u^2}{2}+C$ +2 $= \frac{1}{10}\tan^{-1}\left(\frac{x}{5}\right)+C$ +1

+1 correct sign/coeff

2. (8 points) Find the area enclosed by the curves $y = x^2 - 2x$, and $y = x$.



$x^2-2x = x$

$x^2-3x = 0$

$x(x-3) = 0$

$x = 0, 3$] +2

$\int_0^3 x-(x^2-2x)\,dx$] +2

$= \int_0^3 -x^2+3x\,dx$

$= \frac{-x^3}{3}+\frac{3x^2}{2}\Big|_0^3 = \frac{-(3)^3}{3}+\frac{3(3)^2}{2}-\left(\frac{-0^3}{3}+\frac{3(0)^2}{2}\right) = -9+\frac{27}{2}$

$= \boxed{\frac{9}{2}}$ +2

+2