

You must show **all** work to receive full credit. All work is to be your own.

October 5

This is a closed books and notes test. Be organized. Total points: **20**

19:44- 19:57

1. §10.4 Evaluation of Line Integrals by Green's Theorem. Using Green's Theorem, evaluate  $\int_C \mathbf{F}(\mathbf{r}) \cdot d\mathbf{r}$  counterclockwise around the boundary curve  $C$  of the region  $R$ , where

$$\mathbf{F} = [2x - 3y, x + 5y], R : 16x^2 + 25y^2 \leq 400, y \geq 0$$

20 points

*Hint:* The following identities might be useful:

$$\int \sqrt{a^2 - u^2} du = \frac{u}{2} \sqrt{a^2 - u^2} + \frac{a^2}{2} \sin^{-1} \frac{u}{a} + C \quad \text{and} \quad \int \frac{u^2 du}{\sqrt{a^2 - u^2}} = -\frac{u}{2} \sqrt{a^2 - u^2} + \frac{a^2}{2} \sin^{-1} \frac{u}{a} + C$$