

Credit will be awarded for correct content and clarity of presentation. This assignment can add 20pts to your Test 2 score. Partial credit is also awarded if need be. You may consult your text and my website and notes but no working with others. You should not even discuss level of difficulty. This is to be done individually. You are free to ask me questions, but I will probably not help unless it is an issue of lack of clarity in the statement of the question. (you will need a calculator for this problem, the angles involved are not particularly pretty, don't forget to work in radians, you'll want to keep 4 or 5 digits most places) Please give an answer which is in decimal form at the end, I wish to see 4 significant digits in your answer. I got that the answer is pretty close to 2, I will grade you partially on how close you get to the correct result. Of course setting up the integration region is worth $\frac{1}{2}$ the credit in this problem, 5pts towards changing the actual integrand and measure dA .

- 1) [20pts] Suppose R is the region bounded by $y = 1 + x$ and $y = \sqrt{3}x$ and $y \geq 0$ and the circle $x^2 + y^2 = 4$. Calculate the following integral by making a change of variables to polar coordinates. Graph the region R carefully before you begin the integration.

$$\iint_R \left(\frac{y-x}{x^2+y^2} \right) dA$$