Math 233 - Homework 5

Name _____

December 2, 2021

Score _____

The following problems are from the suggested homework. Show all work to receive full credit. Supply explanations when necessary. This assignment is due December 9.

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1. (2.5 points) Evaluate the double integral shown below, where R is the triangle in the xy-plane with vertices at $(0, 0)$, $(0, 2)$, and $(2, 2)$.

$$\iint_R (1 - x)\, dA$$

2. (2.5 points) Let D be the 1st quadrant region bounded by the graphs of $y = 1 - x^2$, $y = 4 - x^2$, $x = 0$, and $y = 0$. Evaluate the double integral.

$$\iint_D x\, dA$$

Turn over.

3. (2.5 points) Evaluate by first converting to polar coordinates.

$$\int_0^4 \int_{-\sqrt{16-x^2}}^{\sqrt{16-x^2}} \sin(x^2+y^2)\,dy\,dx$$

4. (2.5 points) Find the total area of the region enclosed by the four-leaved rose $r = \sin 2\theta$.