Using polar Variables.

Spring 2016

Attendance Quizzes

March 23, 2016

Quiz 20 Using polar Variables.

Consider the double integral

$$I = \iint_R \left(\sqrt{10x^2 + 10y^2}\right)\, dA$$

where R is the region inside and on the circle $x^2 + y^2 = 10$.
Answer the following.

1. Rewrite the integral by changing to polar coordinates. Be sure to carefully write out the limits of the new integral and the transformed integrand. **Answer:**

$$\int_0^{2\pi} \int_0^{\sqrt{10}} \sqrt{10} r (r\, dr\ d\theta).$$

2. Evaluate and simplify the integral. **Answer:**

$$\int_0^{2\pi} \left(\sqrt{10} r^3/3 \Big|_0^{\sqrt{10}}\right) d\theta = (100/3)(2\pi).$$