MATH 1920, Fall 2017
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Sections: 201, 202

Name:_____

Section 16.3-16.5 Review

Section 16.3 Additional Exercises

1. Calculate
$$\int\int\int_W f(x,y,z)\ dV$$
for $f(x,y,z) = z$; $W : x^2 \leq y \leq 2, 0 \leq x \leq 1$, $x - y \leq z \leq x + y$.

2. Find the volume of the solid in $\mathbb{R}^3$ bounded by $y = x^2, x = y^2, z = x + y + 5$, and $z = 0$.

3. Describe the domain of integration of
$$\int_0^3 \int_0^{\sqrt{9-x^2}} \int_0^{\sqrt{9-x^2-y^2}} f(x,y,z)\ dzdydx.$$

Section 16.3 Additional Exercises

1. Use polar coordinates to find the integral of $f(x,y) = x^2 + y^2$ over the unit circle.

2. Evaluate the following integral by changing to polar coordinates. Be sure to sketch the domain of integration.

$$\int_1^2 \int_0^{\sqrt{2x-x^2}} \frac{1}{\sqrt{x^2+y^2}}\, dydx$$

3. Use spherical coordinates to calculate the triple integral of $f(x,y,z) = y$; $x^2+y^2+z^2 = 1$, $x, y, z \leq 0$.

Section 16.5 Additional Exercises

1. Numbers X and Y between 0 and 1 are chosen randomly. The joint probability density is $p(x,y) = 1$ if $0 \leq x \leq 1$ and $0 \leq y \leq 1$, and $p(x,y) = 0$ otherwise. Calculate the probability P that the product XY is at least $\frac{1}{2}$.