

LAST NAME (Print): \_\_\_\_\_ FIRST: \_\_\_\_\_

Statistics 111      **Quiz 7**

1. Suppose  $f(x, y) = c$  for all  $(x, y)$  such that lie on the perimeter of the circle  $x^2 + y^2 \leq 3$ . The following questions can be answered with minimal calculation, just geometry.

- \_\_\_\_\_ What is the value of  $c$ ?
- \_\_\_\_\_ What is the value of  $\mu_X$ ?
- \_\_\_\_\_ What is the expected value of the product  $XY$ ?
- \_\_\_\_\_ What is the correlation?
- \_\_\_\_\_ Are  $X$  and  $Y$  independent?

Explain your answer regarding independence.

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What is  $g_2(y|x)$ ?

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2. Suppose  $f(x, y) = 6x$  for  $x + y \leq 1$  with both  $x$  and  $y$  restricted to be between 0 and 1.

What is the marginal density of  $X$ ? (Indicate support.)

$f_1(x) =$

- \_\_\_\_\_ What is the expected value of  $X$ ?

What is the conditional density of  $Y$  given  $X = x$ ? (Indicate support.)

$g_2(y | x) =$

- \_\_\_\_\_ What is  $\mathbb{E}[XY]$ ?