

*Stat 134: Section 18*

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*Conceptual Review*

- a. If  $(X, Y)$  has density  $f(x, y)$  in the plane, then what is the density of  $X + Y$ ?
- b. What is the density of  $Y/X$ ?

*Problem 1*

Let  $X = U + V$ ,  $Y = UV$  for independent uniform  $(0, 1)$  variables  $U$  and  $V$ . Find the density of  $X$  and  $Y$ .

*Problem 2*

Suppose  $X, Y \sim \text{Exp}(\lambda)$ , and  $X, Y$  are independent.

(a) Find the density of  $Z = X/Y$ .

(b) Find the density of  $W = \frac{X}{X+Y}$