

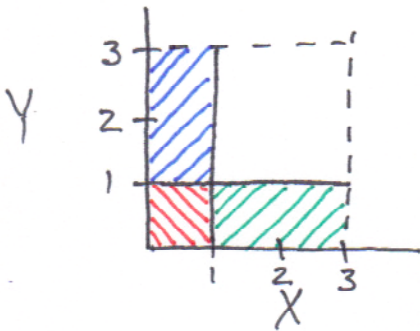
### Problem 78

$$f(x,y) = \frac{x+y}{27} \quad \begin{array}{l} 0 < x < 3 \\ 0 < y < 3 \end{array}$$

Find  
 $p(\text{Device fails during 1st hour})$

Device fails when either of the 2 components fail

- Possibilities:
- I) X fails, Y does not
  - II) Y fails, X does not
  - III) Both X, Y fail



Total area inside  
dashed box is equal to 1

$$\int_0^1 \int_0^3 \frac{x+y}{27} \cdot dy \cdot dx + \int_0^1 \int_1^3 \frac{x+y}{27} \cdot dx \cdot dy = .41$$

or

$$1 - \int_1^3 \int_1^3 \frac{x+y}{27} \cdot dy \cdot dx = .41$$

**B**