

**Instructions:** Show all work, and provide exact answers. For full credit will be given to the steps shown than for the final answer. Be sure to provide thorough explanations.

1. What is the domain of  $f(x, y) = \sqrt{y - 3x}$ ?

$$y - 3x \geq 0$$

$$\Rightarrow y \geq 3x$$

$$D = \{(x, y) \mid y \geq 3x\}$$

2. Find  $f_x$  and  $f_y$  for  $f(x, y) = y \ln(x + 2y)$ .

$$f_x = \frac{y}{x+2y}$$

$$f_y = \ln(x+2y) + \frac{y}{x+2y} (2)$$