Quiz 12

Name

1. (4 points) Find all the first partial derivatives of the function below.

$$f(x,y) = 3e^{6y-7x}$$

$$f_x = 3e^{6y-7x} \cdot (-7) = -21e^{6y-7x}$$
  
$$f_y = 3e^{6y-7x} \cdot (6) = 18e^{6y-7x}$$

2. (6 points) Given the function and its first partials, find all the second partial derivatives.

$$f(x,y) = \ln |5x - 7y|$$
  
$$f_x(x,y) = \frac{5}{5x - 7y} \qquad f_y(x,y) = \frac{-7}{5x - 7y}$$

We can use the quotient rule or rewrite the first partial derivatives as

$$f_x(x,y) = 5(5x - 7y)^{-1}$$
  $f_y(x,y) = -7(5x - 7y)^{-1}$ 

$$f_{xx} = 5(-1)(5x - 7y)^{-2}(5) = -25(5x - 7y)^{-2}$$
$$f_{xy} = 5(-1)(5x - 7y)^{-2}(-7) = 35(5x - 7y)^{-2}$$
$$f_{yy} = (-7)(-1)(5x - 7y)^{-2}(-7) = -49(5x - 7y)^{-2}$$
$$f_{yx} = (-7)(-1)(5x - 7y)^{-2}(5) = 35(5x - 7y)^{-2}$$