If \( f(x, y) = x^2 - 5xy + y^2 \)

A) Calculate the gradient of \( f \) at \((1, 1)\). (Also known as \( \nabla f(1, 1) \).)

B) You compute the directional derivative of \( f \) at \( a \) in the direction of a unit vector \( u \) by computing the dot product of the gradient of \( f \) at \( a \) and the vector \( u \).

Calculate the directional derivative of \( f \) at \((1, 1)\) in the direction \( \left( \frac{1}{\sqrt{5}}, \frac{2}{\sqrt{5}} \right) \).