**Worksheet 9**

**1.** Find the directions in which the directional derivative of $f(x, y) = x^2 + \sin(xy)$ at the point $(1, 0)$ has the value 1.

**2.** Let $f$ be a function of two variables that has continuous partial derivatives, and consider the points:

$$A(1, 3); \ \ B(3, 3); \ \ C(1, 7); \ \ D(6, 15).$$

The directional derivative of $f$ at $A$ in the direction of the vector $\overrightarrow{AB}$ is equal to 3, and the directional derivative at $A$ in the direction of the vector $\overrightarrow{AC}$ is equal to 26. Find the directional derivative of $f$ at $A$ in the direction of the vector $\overrightarrow{AD}$.