



 $\frac{\partial f}{\partial x}$



 $D_{\vec{i}}f(x,y)$

$D_{\vec{\mathbf{i}}}f(x,y)$

This is the slope of the tangent plane when (x, y) is moved in the direction of \vec{i}

$$D_{\vec{\mathbf{i}}}f(x,y) = \frac{\partial f}{\partial x}$$



 $\frac{\partial f}{\partial y}$



$$D_{\vec{\mathbf{j}}}f(x,y)$$

This is the slope of the tangent plane when (x, y) is moved in the direction of \vec{j}

$$D_{\vec{\mathbf{j}}}f(x,y) = \frac{\partial f}{\partial y}$$

$D_{\vec{\mathbf{v}}}f(x,y)$

This is the slope of the tangent plane when (x, y) is moved in the direction of $\vec{\mathbf{v}} = \langle v_1, v_2 \rangle$

 $D_{\vec{\mathbf{v}}}f$ is the *directional derivative* of f in the direction of $\vec{\mathbf{v}}$.



$D_{\vec{\mathbf{v}}}f(x,y)$

 $D_{\vec{\mathbf{v}}}f(x,y)$ is the slope of the tangent plane when (x,y) is moved in the direction of $\vec{\mathbf{v}}$

