1. **Measurement**

   a) Find the rate of change in the surface in the x-direction at the **blue** dot on your surface. Include units.

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

   b) Find the rate of change in the surface in the y-direction at the **blue** dot on your surface. Include units.

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

   c) Draw an arbitrary vector $\vec{\boldsymbol{u}}$ at the blue dot *on the contour mat*. What are its components?

   $$\vec{\boldsymbol{u}} = \_\_\_\_\_$$

   d) Find the rate of change in the surface in the $\vec{\boldsymbol{u}}$-direction. Include units.

   $$\frac{df}{ds} = \_\_\_\_\_$$

2. **Computation**

   a) Determine the gradient of f at the blue dot.

   $$\vec{\boldsymbol{\nabla}} f = \_\_\_\_\_$$

   b) Use the Master Formula to express $\frac{df}{ds}$ in terms of $\vec{\boldsymbol{\nabla}} f$, and compute the result.

   $$\frac{df}{ds} = \_\_\_\_\_$$

3. **Comparison**

   - Compare your answers.