Student handout

Suppose that $x = s\cos\phi$ and $y = s\sin\phi$.

1. Let $h(x, y) = xy$. Determine $\frac{\partial h}{\partial s}$ (with ϕ held constant) and $\frac{\partial h}{\partial \phi}$ (with s held constant).
2. Find at least one more way to compute these derivatives.
   Make sure you get the same answer!
3. Determine $\frac{\partial s}{\partial x}$ and $\frac{\partial \phi}{\partial x}$ (with y held constant).
4. Find at least one more way to compute these derivatives.
   Make sure you get the same answer!

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Instructor's guide

If surfaces are available, Chain Rule Measurement is a possible alternative to this activity.