

Name: _____

Task Master: _____ Cynic: _____ Recorder: _____

MTH 254

CHAIN RULE

Spring 2015

Working in small groups (3 or 4 people), solve as many of the problems below as possible. Try to resolve questions within the group before asking for help. Each group member should then write up the solutions in their own words; Show your work! Full credit will only be given if your answer is supported by calculations and/or explanations as appropriate.

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

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