

## Precept — week 2

Total differential:  $df(x, y) = \frac{\partial f(x, y)}{\partial x} dx + \frac{\partial f(x, y)}{\partial y} dy$

In part 1(a), derive an implicit equation of the form  $f(h, t, \tau) = 0$ .

Then explore how a change in  $t$  or  $\tau$  affects  $f$ .  $0 = \frac{\partial f}{\partial h} dh + \frac{\partial f}{\partial t} dt + \frac{\partial f}{\partial \tau} d\tau$

But WLOG we hold  $\tau$  constant and solve for  $\frac{dh}{dt} = -\frac{\frac{\partial f}{\partial t}}{\frac{\partial f}{\partial h}}$  and evaluate. Can also use implicit function theorem.