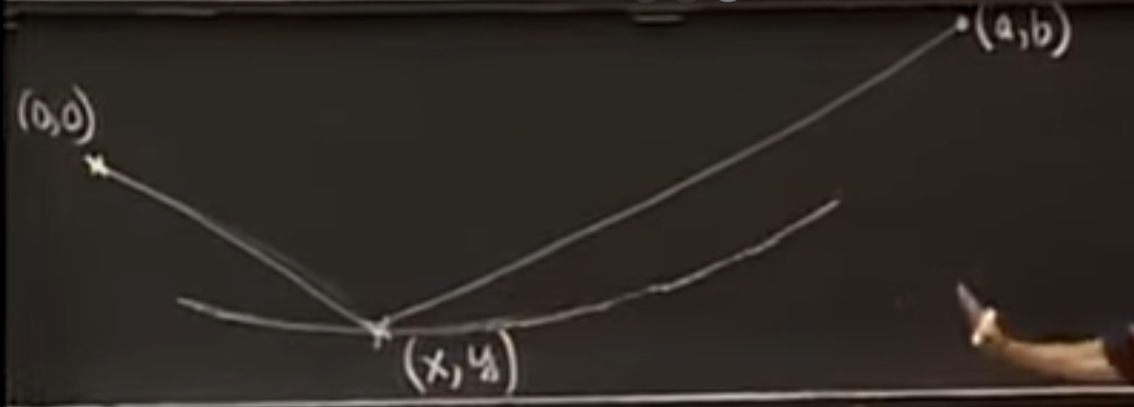
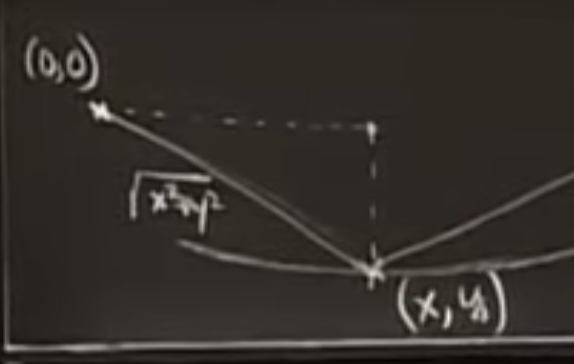
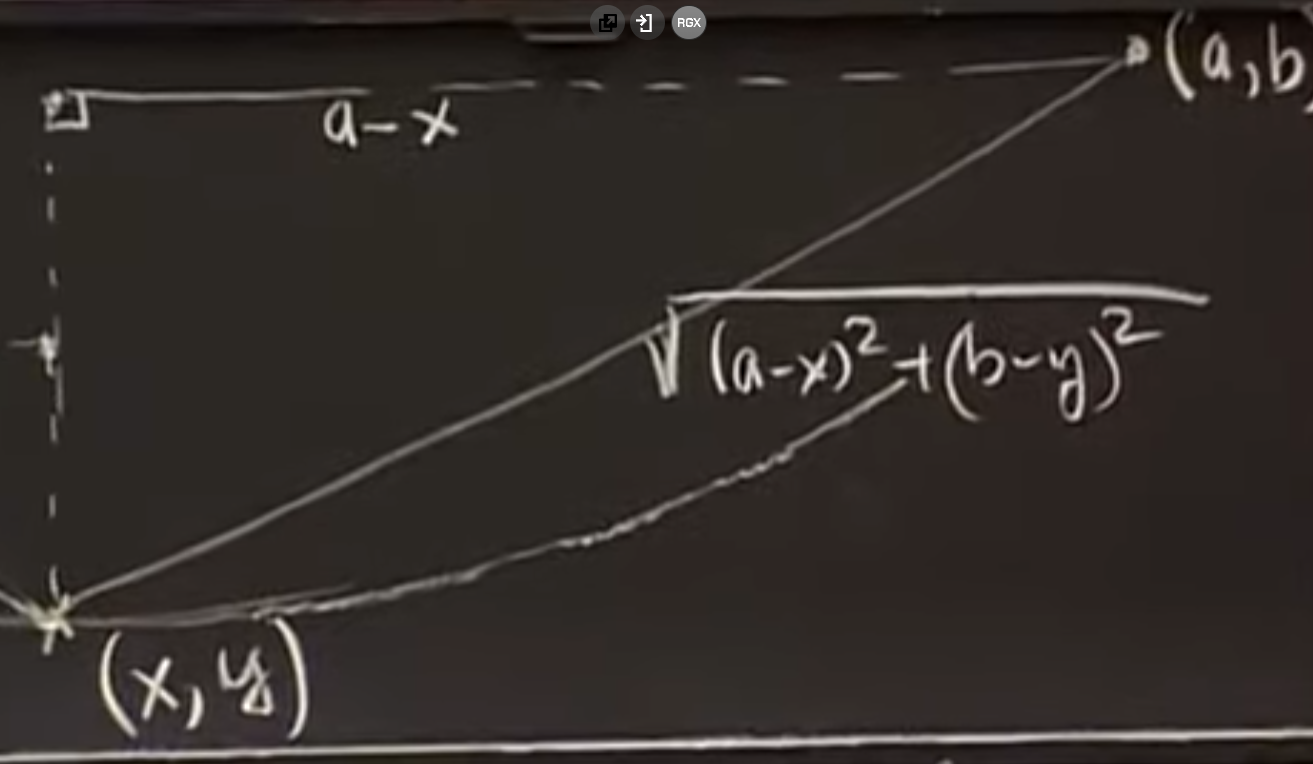
First setup



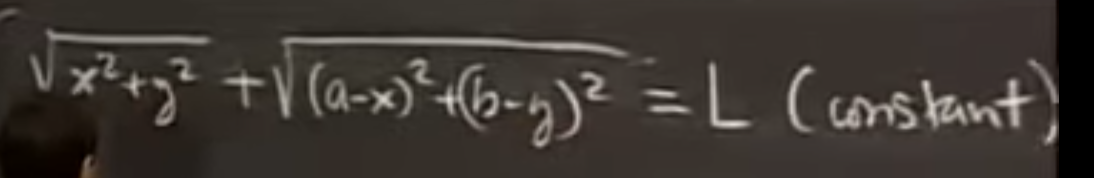
* Length of the string is constant

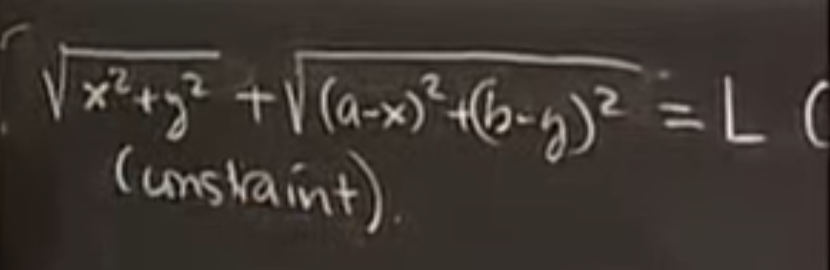


* Left hand



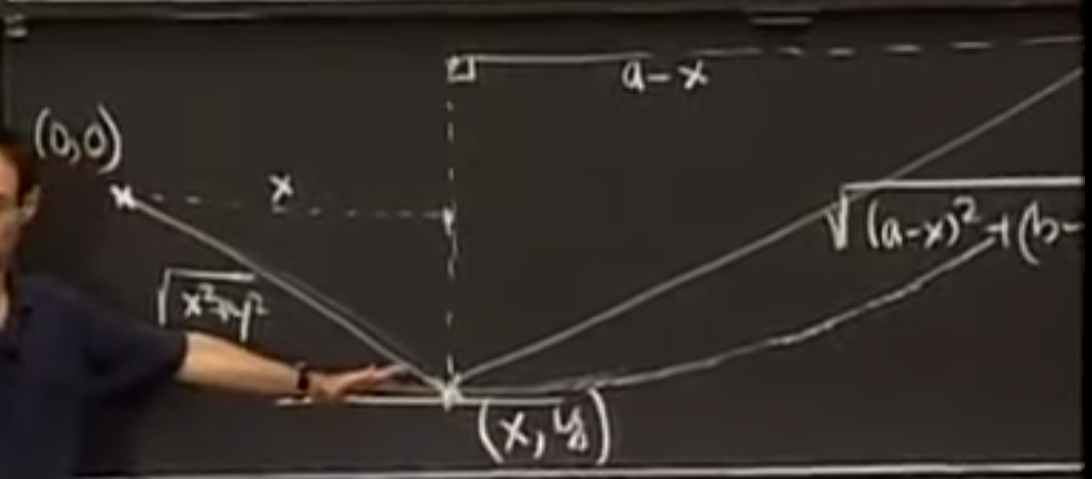
* Right hand



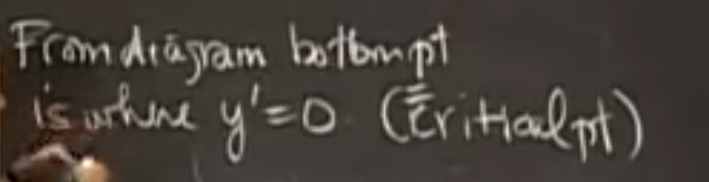


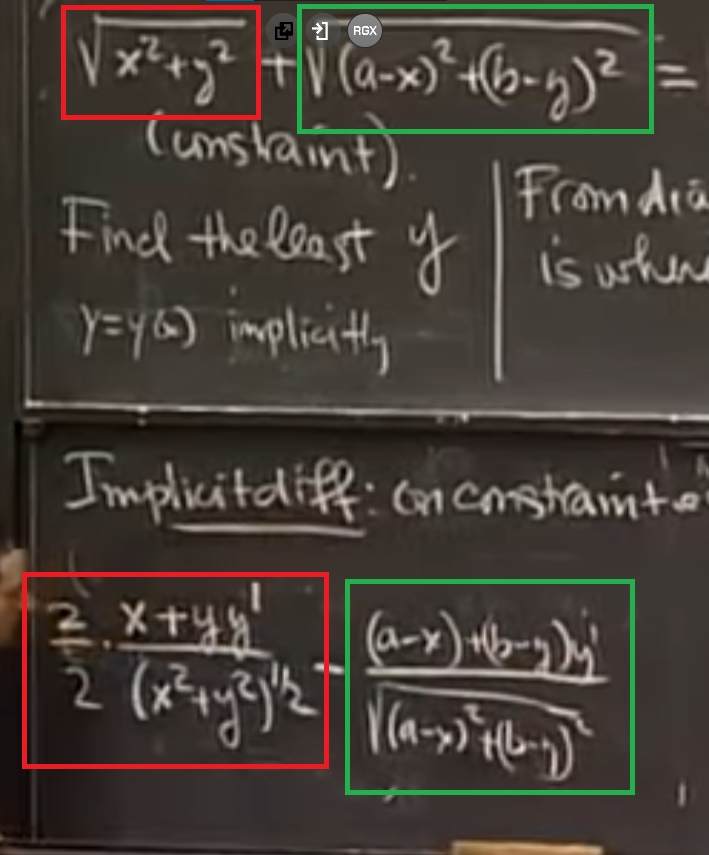


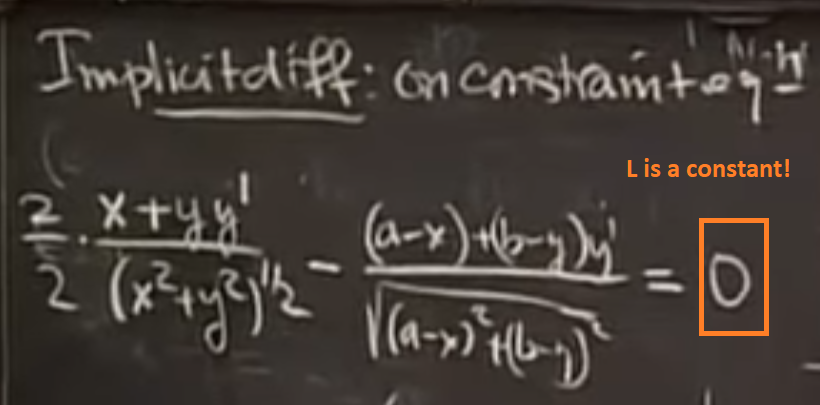
* We already have defined y(x) implicitly



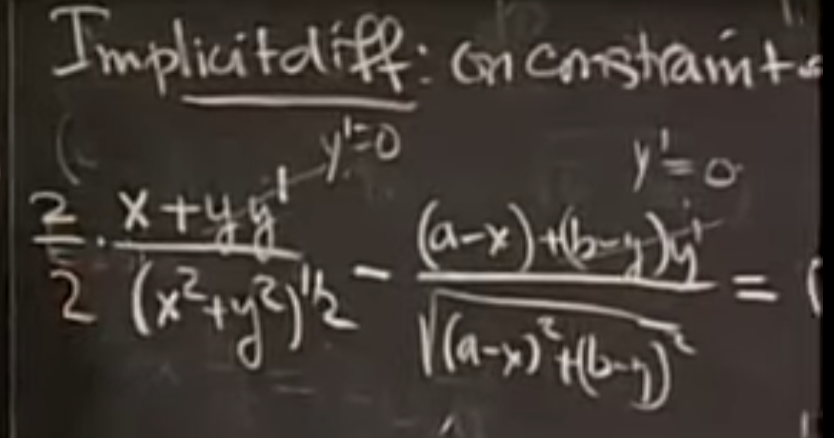
* Horizontal slope



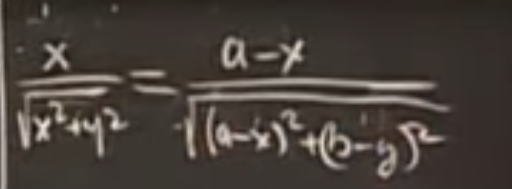




Simplify:

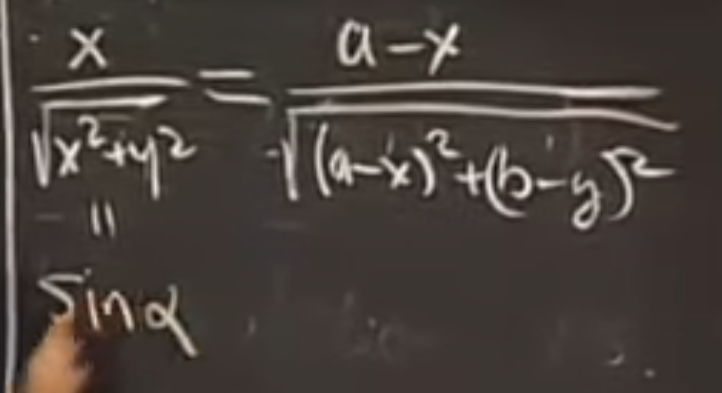


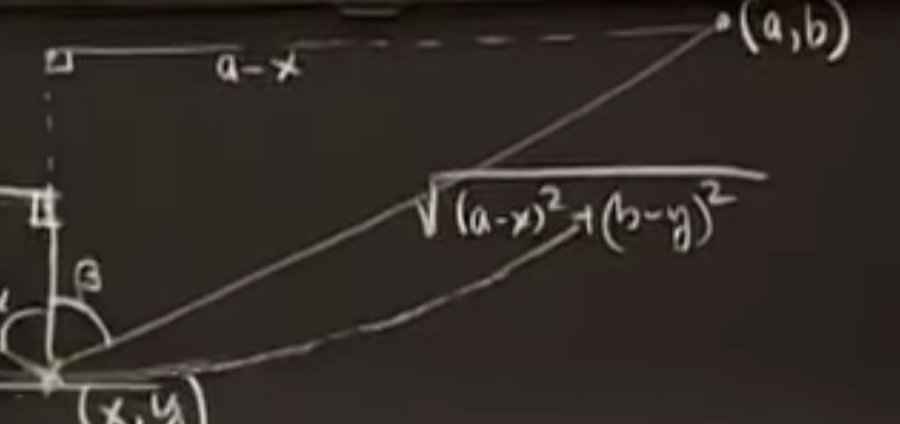
* We are targeting y’ = 0 (horizontal slope)





* Left hand side can be expressed in terms of alpha angle

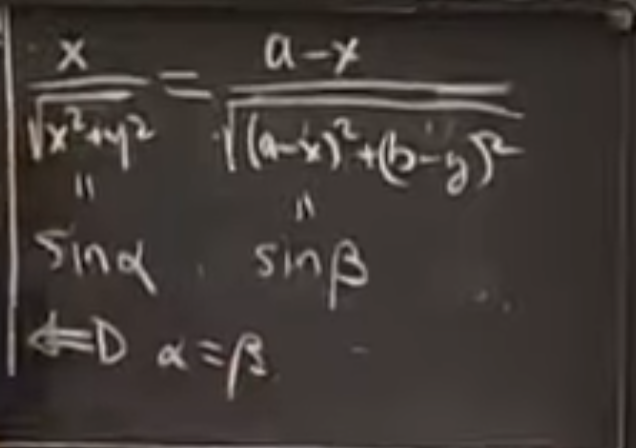




* Right hand side can be expressed in terms of beta angle



Therefore, alpha = beta



Therefore, there is always a hidden symmetry in the angles of the sag

