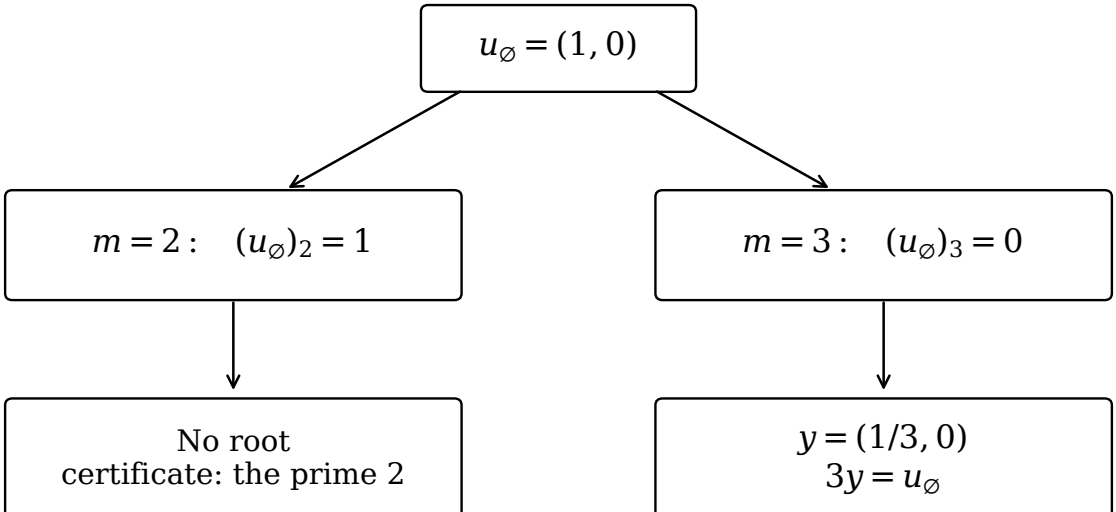

$u_\varnothing = (1, 0)$
$m = 2: \quad (u_\varnothing)_2 = 1$
$m = 3: \quad (u_\varnothing)_3 = 0$
No root
certificate: the prime 2
$y = (1/3, 0)$
$3y = u_\varnothing$