

1. A particle moves along the curve $y = \frac{1}{1+x^2}$. When the particle reaches the point $(1, \frac{1}{2})$ its y -coordinate is decreasing at a rate of 3 m/s. How fast is the x -coordinate changing at this instant?

2. A footlight shines from the floor of a stage on a wall 12 m away. An 2 m tall actor walks away from the light toward the wall at a rate of 2 m/s. How fast is the height of the actor's shadow changing when the actor is 4 m from the light?