

Quiz 5 Solutions

1. If $x^2 + xy + y^2 = 13$, evaluate dy/dx at $x = 1$, $y = 3$.

Differentiate implicitly to get $2x + y + xy' + 2yy' = 0$, and solve for $y' = -(2x + y)/(x + 2y)$.
At $x = 1$, $y = 3$, this gives $y' = -5/7$.

2. Differentiate the function $y = x^{\tan x}$.

$$\ln y = (\tan x)(\ln x),$$

$$y'/y = (\sec^2 x)(\ln x) + (\tan x)/x,$$

$$y' = x^{\tan x}((\sec^2 x)(\ln x) + (\tan x)/x).$$