

Solutions

2.1 Chain rule gives $4(3x+1)^3 \times 3$; at zero this is 12.

2.2 Implicit differentiation gives $2x+2y y' = 0$, so $y' = -3/4$.

2.3 Product rule gives $e^x + xe^x$; at zero this is 1.

2.4 False. A derivative of a product is not the product of the derivatives. In implicit differentiation, every differentiated function of y brings a dy/dx factor. A quotient's denominator is squared.

2.5 A The rule that multiplies the outer derivative by the inner derivative for a composite function.

3.1 $y' = -x/y$ where $y \neq 0$. At $(3, 4)$, $-3/4$. At $(5, 0)$ the tangent is vertical, so finite dy/dx is undefined; implicit differentiation does not license division by zero.