

KEY

Math 125-Quiz 18¹

October 26, 2011

You have ten minutes to complete this quiz.

1. Let $x^2 = y^3 + 3y^2$. Find $\frac{dy}{dx}$.
d.iff both sides w.r.t. x

$$2x = 3y^2 \frac{dy}{dx} + 6y \frac{dy}{dx} \rightarrow \frac{dy}{dx} = \frac{2x}{3y^2 + 6y}$$

2. Let $xy = 3$. Find $\frac{dy}{dx}$ two ways

(a) By implicit differentiation

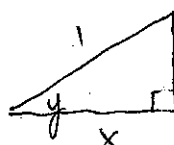
$$y + x \frac{dy}{dx} = 0 \quad \frac{dy}{dx} = -\frac{y}{x}$$

(b) By first solving for y and using derivative rules

$$y = \frac{3}{x} = 3x^{-1} \quad \frac{dy}{dx} = -3x^{-2} = -\frac{3}{x^2} = \frac{-3/x}{x} = -\frac{y}{x} \checkmark$$

3. Let $y = \arccos(x)$. Find $\frac{dy}{dx}$ by implicit differentiation.

$$x = \cos y \\ 1 = (-\sin y) \frac{dy}{dx}$$



$$\sin y = \frac{\sqrt{1-x^2}}{1}$$

$$\frac{dy}{dx} = -\frac{1}{\sin y} \quad \frac{dy}{dx} = -\frac{1}{\sqrt{1-x^2}}$$

¹You are excused to leave when you're finished with this quiz.