

Topic: Implicit differentiation**Question:** Using implicit differentiation, we...**Answer choices:**

- A treat x as a variable and y as a function
- B treat x as a variable and y as a variable
- C treat x as a function and y as a function
- D treat x as a function and y as a variable



Solution: A

When we use implicit differentiation, it's important to remember that we can't treat y as a variable, the same way we would if we were differentiating "normally."

In contrast, we have to treat y as a function of y in terms of x , and therefore apply chain rule whenever we take the derivative of y , which means we multiply by y' .



Topic: Implicit differentiation

Question: Every time we take the derivative of y , implicit differentiation requires us to multiply by which of the following?

Answer choices:

A 1

B y

C 0

D y'



Solution: D

We have to treat y as a function of y in terms of x , and therefore apply chain rule whenever we take the derivative of y , which means we multiply by y' every time we differentiate y .



Topic: Implicit differentiation**Question:** Use implicit differentiation to find the derivative.

$$x^2 - y^2 = 9$$

Answer choices:

A $y' = -\frac{x}{y}$

B $y' = -\frac{y}{x}$

C $y' = \frac{x}{y}$

D $y' = \frac{y}{x}$



Solution: C

Using implicit differentiation to take the derivative of both sides of the equation gives

$$2x - 2yy' = 0$$

$$-2yy' = -2x$$

$$yy' = x$$

$$y' = \frac{x}{y}$$

