

Quiz 8

- If $y^2x - 2y = 8$ and $y = 4$, $\frac{dx}{dt} = \frac{3}{2}$, find $\frac{dy}{dt}$.

Solution:

First, find x . We know that $y = 4$ so $(4)^2x - 2(4) = 8$ shows us that $x = 1$.

Next, differentiate.

$$2y \frac{dy}{dt} x + y^2 \frac{dx}{dt} - 2 \frac{dy}{dt} = 0$$

Solve for $\frac{dy}{dt}$.

$$\frac{dy}{dt} = \frac{-\frac{dx}{dt} y^2}{2yx-2}$$

Substitute to find $\frac{dy}{dt}$.

$$\frac{dy}{dt} = \frac{-\frac{3}{2} \cdot (4)^2}{2 \cdot 4 \cdot 1 - 2} = -4$$