Answer on Question #48610 – Math – Calculus

find dy/dx when x^2/a^2+y^2/b^2=1

Solution

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$$

To avoid the quotient rule, rewrite out equation as

$$x^2b^2+y^2a^2=a^2b^2$$

Then differentiate both sides of the equation remembering that a and b are constants, we have

$$\frac{d(x^2b^2)}{dx}+\frac{d(y^2a^2)}{dx}=\frac{d(a^2b^2)}{dx}$$

$$2xb^2+2ya^2\frac{dy}{dx}=0$$

$$2ya^2\frac{dy}{dx}=-2xb^2$$

$$\frac{dy}{dx}=-\frac{2xb^2}{2ya^2}=-\frac{xb^2}{ya^2}$$

Answer: $\frac{dy}{dx}=-\frac{xb^2}{ya^2}$.