# Math OCR Output

* Model: gpt-4o-mini
* Source: ocr\_1.png

## File: ocr\_1.png

### ocr\_1.png

1. **Plain Text (cleaned)**
2. Given:
   * ( x = )
   * ( y = )

* To prove: [ = - ]
* Proof:
  + ( x = )
  + Using chain rule and differentiating w.r.t. ( t ): [ = a ^t a (1) ]
  + Similarly, [ = a ^t a (2) ]
* Dividing (1) & (2) we get: [ = ]
* Therefore, [ = - a ^t a ]
* Simplifying: [ = - = - ]
* Hence proved.

1. **LaTeX**

\text{Given:}  
\begin{align\*}  
x & = \sqrt{a \sin^2 t} \\  
y & = \sqrt{a \cos^2 t}  
\end{align\*}  
  
\text{To prove:}  
\[  
\frac{dy}{dx} = -\frac{y}{x}  
\]  
  
\text{Proof:}  
\begin{align\*}  
x & = \sqrt{a \sin^2 t} \\  
\text{Using chain rule and differentiating w.r.t. } t: \\  
\frac{dx}{dt} & = \frac{1}{2\sqrt{a \sin^2 t}} \cdot \frac{1}{\sqrt{1 - t^2}} \cdot a \sin^t \log a \quad (1) \\  
\text{Similarly,} \\  
\frac{dy}{dt} & = \frac{1}{2\sqrt{a \cos^2 t}} \cdot \frac{1}{-\sqrt{1 - t^2}} \cdot a \cos^t \log a \quad (2)  
\end{align\*}  
  
\text{Dividing (1) \& (2) we get:}  
\[  
\frac{dy}{dt} = \frac{dy}{dx} \cdot \frac{dx}{dt}  
\]  
  
\text{Therefore,}  
\[  
\frac{dy}{dx} = -\frac{a \cos^t}{2\sqrt{a \cos^2 t} \cdot \sqrt{1 - t^2}} \cdot a \sin^t \log a  
\]  
  
\text{Simplifying:}  
\[  
\frac{dy}{dx} = -\frac{a \cos^t}{\sqrt{a \sin^2 t}} = -\frac{y}{x}  
\]  
  
\text{Hence proved.}

1. **Notes / Ambiguities**

* [unclear: “Using chain role and differentiating w.r.t. t;”]
* [unclear: “a sin^t log a”]
* [unclear: “a cos^t log a”]
* [unclear: “a cos^t / 2 sqrt{a cos^2 t} sqrt{1 - t^2}”]