



$a x^2 = x^2 / (1 + x^2)$  where  $x = -1$  

Input interpretation :

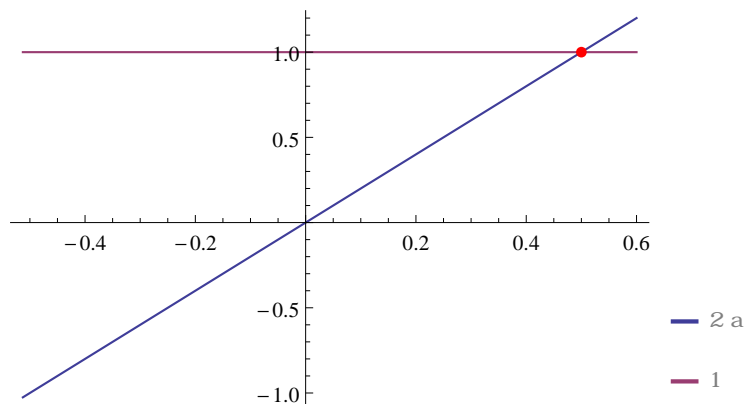
$$a x^2 = \frac{x^2}{1 + x^2} \text{ where } x = -1$$



Result:

$$2 a = 1$$

Plot:



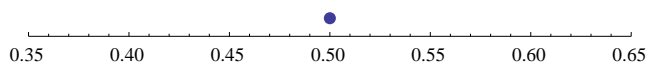
Alternate form :

$$2 a - 1 = 0$$

Solution:

$$a = \frac{1}{2}$$

Number line:



plot piecewise({{x^2/2,x<-1},{x^2/(x^2+1),x>=-1}}, x=-2..2

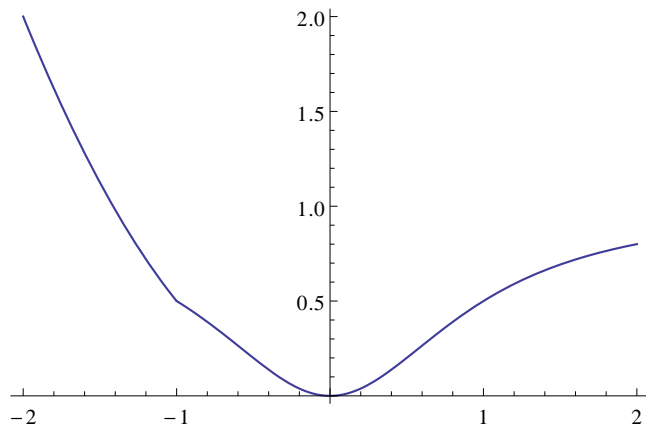
Input interpretation :

plot

$$\begin{cases} \frac{x^2}{2} & x < -1 \\ \frac{x^2}{x^2+1} & x \geq -1 \end{cases} \quad x = -2 \text{ to } 2$$



Plot:





diff  $x^2/2 = x^2/(x^2+1)$  where  $x = -1$



Input interpretation :

$$\frac{\partial}{\partial x} \left( \frac{x^2}{2} = \frac{x^2}{x^2+1} \right) \text{ where } x = -1$$



Result:

**False**



lim it x^ 2/(x^ 2+1), x->infinity



Limit :

$$\lim_{x \rightarrow \infty} \frac{x^2}{x^2 + 1} = 1$$



Series expansion at :  $x = \infty$ :

$$1 - \left(\frac{1}{x}\right)^2 + \left(\frac{1}{x}\right)^4 + \mathcal{O}\left(\left(\frac{1}{x}\right)^6\right)$$