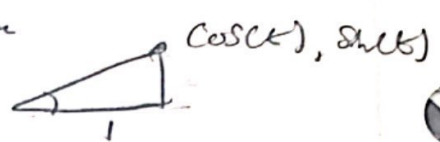


$$\tan(\theta) = \frac{\text{opposite}}{\text{adjacent}}$$



1. The experience of math beauty and its neural correlates
2. Johann Heinrich Lambert
3. 1768th
4. what did you do wrong?

$$1. f(x) = \arctan x$$

$$f'(x) = \frac{1}{1+x^2} = \frac{1}{1-(-x^2)}$$

$$\text{Geometric series } \frac{1}{1-x} = \sum_{n=0}^{\infty} x^n$$

$$\frac{1}{1-(-x^2)} = \sum_{n=0}^{\infty} (-x^2)^n = \sum_{n=0}^{\infty} (-1)^n x^{2n} = f'(x)$$

$$f(x) = \int \sum_{n=0}^{\infty} (-1)^n x^{2n} dx = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{2n+1} + C$$

$$\text{since } f(0) = 0 \text{ then } C = 0$$

$$\text{So } \arctan x = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{2n+1}$$