

What's the inverse of your name? key

AP Calculus AB: 3.14 Derivatives of Inverse Trig Functions

1. Find $\frac{d}{dx}(\arctan(6x))$

$$\frac{6}{1+36x^2}$$

2. Find $\frac{d}{dx}(\arccos(-5x^2))$

$$\frac{-10x}{\sqrt{1-25x^4}}$$

3. Find the slope of a line tangent to the graph of $f(x) = \arctan(4x)$ at $x = \frac{1}{2}$.

$$f'(x) = \frac{4}{1+16x^2}$$

$$f'(\frac{1}{2}) = \boxed{\frac{4}{5}}$$

4. Find the derivative of $f(x) = \frac{\operatorname{arccot}(4x)}{3x^2}$ } Quotient Rule

$$f'(x) = \frac{3x^2 \left(\frac{-4}{1+16x^2} \right) - \operatorname{arccot}(4x) (6x)}{9x^4} = \frac{-\frac{12x^2}{1+16x^2} - 6x \operatorname{arccot}(4x)}{9x^4}$$
$$= \frac{-6x \left(\frac{2x}{1+16x^2} - \operatorname{arccot}(4x) \right)}{9x^4} = \boxed{\frac{-2 \left(\frac{2x}{1+16x^2} - \operatorname{arccot}(4x) \right)}{3x^3}}$$

5. Find the slope of the function $g(x) = \underbrace{\arcsin(2x)}_{\text{product}} \cdot e^{3x}$ at $x = 0$

$$g'(x) = e^{3x} \left(3\arcsin(2x) + \frac{2}{\sqrt{1-4x^2}} \right)$$

$$g'(0) = \boxed{2}$$

6. Evaluate $\frac{d}{dx}(\ln(2x+5))$ at $x = \frac{1}{4}$

$$f'(\frac{1}{4}) = \boxed{\frac{4}{11}}$$