

Math 181 Honors Quiz 8 Version A

1. Fill in the following derivative rules:

$$\frac{d}{dx} x^n = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \sin x = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \arcsin x = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \tan x = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \cot x = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \arctan x = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \cos x = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \operatorname{arcsec} x = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \sec x = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \operatorname{arccsc} x = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \sqrt{x} = \boxed{\phantom{000}}$$

$$\frac{d}{dx} \csc x = \boxed{\phantom{000}}$$

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2. Use implicit differentiation to find  $\frac{dy}{dx}$  where  $y^3 + 3yx = \cos(y + x)$ .

3. Use induction to prove  $\sum_{k=1}^n k^2 = \frac{n(n+1)(2n+1)}{6}$ .