

NAME: OBOBI CHRISTABEL

MATRIC NUMBER: 1913011070

①

Solution

$$y = \tan^{-1} 3x^4$$
$$y = \frac{3x^4}{\tan}$$

$$\tan y = 3x^4$$
$$\sec^2 y \frac{dy}{dx} = 12x^3$$

$$\frac{dy}{dx} = \frac{12x^3}{\sec^2 y}$$

$$\frac{dy}{dx} = \frac{12x^3}{1+9x^8}$$

$$\sec y = \frac{1}{\cos y}$$
$$\cos y = \frac{1}{\sqrt{1+9x^8}}$$
$$\sec y = \sqrt{1+9x^8}$$
$$\sec^2 y = 1+9x^8$$

②

Solution

$$y = \sin^{-1} 3k$$

$$y = \sin^{-1} 3k$$
$$y = \frac{3k}{\sin}$$

$$3k = \sin y$$

$$\frac{dx}{dy} = \frac{3k}{\cos y}$$

$$\cos y = \frac{\sqrt{1-9k^2}}{1}$$

$$\frac{dy}{dx} = \frac{3}{\sqrt{1-9k^2}}$$

③

Solution

$$\sin^{-1} x^2$$

$$y = \frac{x^2}{\sin}$$

$$x^2 = \sin y$$

$$\cos y = \sqrt{1-x^2}$$

$$\frac{dy}{dx} = \frac{2x}{\sqrt{1-x^2}}$$