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Matric: 19/sci01083

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Course: Math 201.

(1) Find the differential of $y = \arctan 3x^4$

Solution.

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

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

$y \tan = 3x^4$.

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

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

(2)

Find the derivate of $u = \arcsin 3k$.

Solution

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

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

$y = \frac{3k}{\sin}$.

$3k = \sin y$

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

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

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

(3) If $\arcsin x^2$

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

$y = x^2$

$x^2 = \sin y$

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

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

Recall

$\cos^2\theta + \sin^2\theta = 1$

$\cos\theta = \sqrt{1 - \sin^2\theta}$

$\cos^2\theta = \sqrt{1 - \sin^2\theta}$