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Mathematics II

Transcendental Function

Chapter Six

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Examples for Inverse of Trigonometric Function

- **Example:** $\frac{d}{dx} \sec^{-1}(5x^4)$
- **Example:** A particle moves along the x -axis so that its position at any time is $t \geq 0$ is $x(t) = \tan^{-1} \sqrt{t}$ What is the velocity of the particle when $t=16$?
- **Example:** Find the curve whose slope at a point (x,y) is $\frac{1}{x\sqrt{x^2-1}}$ and passes through points $(-2,2)$ and $(\sqrt{2}, 0)$.
- **Example:** find y' for $y = \sin^{-1}(1 - x)$.

Examples for Inverse of Trigonometric Function

- Example: $y = \tan^{-1} \frac{x-1}{x+1}$
- Example: $\int_0^2 \frac{dx}{1+(x-1)^2}$
- Example: $\int \frac{dx}{\sqrt{x}\sqrt{1-x}}$
- Example: Show that $f(x) = \sin^{-1} \frac{x-1}{x+1}$ and $g(x) = 2 \tan^{-1} \sqrt{x}$ have same derivative, then $f(x) = g(x) + c$ find c for $x=0$