

Series 3 : Elementary Functions

Exercise 1

Let the function defined by:

$$f(x) = \arcsin(2x\sqrt{1-x^2})$$

1- What is the domain of definition of f .

2- By setting $t = \sin x$, simplify the writing of f with $t \in [-\frac{\pi}{2}, \frac{\pi}{2}]$.

Exercise 2

Show that for every $x \in [-1, 1]$

$$\arccos x + \arcsin x = \frac{\pi}{2}$$

Exercise 3

Solve the following equations

1- $\arcsin x = \arccos \frac{1}{3} - \arccos \frac{1}{4}$.

2- $\arctan 2x + \arctan 3x = \frac{\pi}{2}$.

Exercise 4

Simplify the following expressions

1- $\text{th}(\text{Argsh}x)$, 2- $\text{sh}(2\text{Argsh}x)$

3- $\frac{2\text{ch}^2 x - \text{sh}2x}{x - \ln(\text{sh}x) - \ln 2}$



ADDITIONAL EXERCISES

Exercise 5

Let the function defined by

$$2 \arcsin x + \arcsin f(x) = \frac{\pi}{6}$$

Give the domain of definition of f . Prove that it admits a reciprocal function for which we will give the definition set.

Exercise 6

Solve the following equations

1- $\arccos x = \frac{\pi}{6}$

2- $\arctan\left(\frac{x}{2}\right) = \pi$

3- $\arcsin x + \arcsin(\sqrt{1-x^2}) = \frac{\pi}{2}$

