University of Badji-Mokhtar Annaba

Mathematics 1 1 ST year : 2023-

Sciences and Technology Depatement 2024

# Series 3 : Elementary Functions

<u>Exercise 1</u>

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 writting of f with  $t \in [-\frac{\pi}{2}, \frac{\pi}{2}]$ .

<u>Exercise 2</u>

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- arctan2x+arctan3x= $\frac{\pi}{2}$ .

# <u>Exercise 4</u>

Simplify the following expressions

1- th(Argshx), 2- sh(2Argshx)

 $3 - \frac{2 c h^2 x - sh2 x}{x - \ln(shx) - \ln 2}$ 



## ADDITIONAL EXERCISES

### <u>Exercise 5</u>

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.

### <u>Exercise 6</u>

Solve the following equations

1- 
$$\arccos x = \frac{\pi}{6}$$
  
2-  $\arctan\left(\frac{x}{2}\right) = \pi$ 

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

