

Series 3 : Elementary Functions

Exercise 1 :

Let the function defined by :

$$f(x) = \arccos(2x - 1) - \arcsin(3x^2)$$

1. Determine the domain of definition of $f(x)$.
2. Calculate the derivative of $f(x)$.

Exercise 2 :

Show that $\forall x > 0$:

$$\arctan x + \arctan \frac{1}{x} = \frac{\pi}{2}$$

Exercise 3 :

Solve the following equations :

- 1) $\arcsin x = \arcsin \frac{2}{5} + \arcsin \frac{3}{5}$
- 2) $\arctan 2x + \arctan 3x = \frac{\pi}{4}$

Exercise 4 :

Simplify the following expressions :

- 1) $\sinh(\arg \cosh(x))$
- 2) $\frac{2 \cosh^2 x - \sinh 2x}{x - \ln(\cosh x) - \ln 2}$
- 3) $\cos(\arctan(x))$