
SOEN 6011 PROJECT DELIVERY ONE

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1 Function Description

$\sinh x$ is a transcendental function and it is defined as following(Formula 1). For reference purpose, identifier F3 is used.

$$F3 : \sinh x = \frac{e^x - e^{-x}}{2} \quad (1)$$

The graph of F3 is shown by Figure 1.1, the domain of F3 is \mathbf{R} and the co-domain of F3 is also \mathbf{R} . F3 is an odd function.

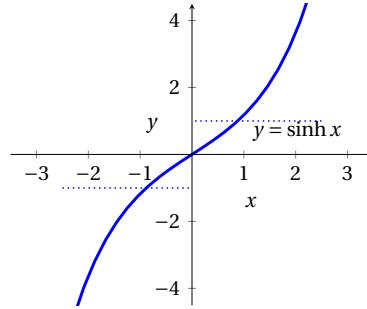


Figure 1: Graph of F3

Main characteristics of F3 is listed as below with proofs[?].

- F3 is one-to-one.

$$\frac{e^m - e^{-m}}{2} = \frac{e^n - e^{-n}}{2} \Leftrightarrow m = n \quad (2)$$

- F3 is onto.

$$\forall x \in \mathbf{R}, \exists y \in \mathbf{R}, \sinh x = y \quad (3)$$

- F3 is bijective function from \mathbf{R} to \mathbf{R} .