

SOEN6011 Problem1

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1 tan(x) function

1.1 Introduction

- The tangent function, denoted tan, is defined as the quotient of the sine function by the cosine function, and it is defined wherever the cosine function takes a nonzero value. In symbols:

$$\tan(x) = \frac{\sin(x)}{\cos(x)}$$

1.2 Properties of tangent function

1.2.1 Domain and Range

- It can be said that all real numbers belong to the domain of the tangent function except the zeroes of the cosine function i.e ;

$$D_f = \frac{R}{(2k+1)(\frac{\pi}{2})}, k \in R$$

- Tangent function takes all the values from $-\infty$ to $+\infty$ as its argument x passes through an interval of the length π , therefore the range,

$$f(D) = R$$

1.2.2 Zeros of the tangent function

- The zeroes of the tangent are determined by the zeroes of the sine function in the numerator.

1.2.3 Parity and periodicity

- Tangent function is an odd function.

$$f(-x) = \tan(-x) = -\tan(x) = -f(x)$$

- The tangent is a periodic function with the period $p = \pi$

1.3 Reference

1. <http://www.nabla.hr/TF-TrigFunctionsD3.htm>