SOEN6011 Problem1

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1 tan(x) function

1.1 Introduction

Trigonometric functions are real function which relate an angle of right angled triangle to ratios of two side length.

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 ;

$D_f = \frac{R}{(2k+1).}\pi_{\overline{2}}(1)$Tangent function takes all the values from -∞ to + ∞ as its argument x passes through an interval of the length π, therefore the range

$$f(D) = Ror \tag{2}$$

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, so

$$x = k$$

π (3)

1.2.3 - Parity and periodicity

tangent function is a odd function

$$f(-x) = tan(-x) = -tan(x) = -f(x) \tag{4}$$

the tangent is periodic function with the period p = π.

1.2.4 Behavior of the tangent function - Monotonicity

The tangent is increasing function in every interval between any of the two successive vertical asymptotes i.e ;

$$f(x_1) < f(x_2) \tag{5}$$

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