Maths 17 A
Chapter 1. Preview and review

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Sommaire

Policies

The final course score will be weighted average of the following components :
- Attendance, and Homework 10/100
- Mid-term exam : 30/100
- Final exam : 60/100

Text books and references :
- Nguyen, H. T. (2007). Lecture notes and teaching-learning materials for course math 17A, Nong Nghiep, 618 p.
- Neyhauser, C. (2010). Calculus for Biology and Medicine (3rd Edition), Pearson, 840 p.
- Stewart, J. (2015). Calculus : Early Transcendentals (8rd Edition), Brooks Cole, 1368 p.

Review : Self study, page 2-14

Real numbers Lines in the Plane
Equation of a Circle
Trigonometry
Exponentials and Logarithms
Complex Numbers and quadratic Equations

What is a function ?

Definition

A function f is a rule that assigns each element x in the set A exactly one element y in the set B. The value y is denoted by $f(x)$.

$$f : A \to B$$

$$x \mapsto y = f(x).$$

One call A-the domain, B- the codomain, and the set $f(A)$ -the range of f.

Graph of f is the following set in x-y plane

$$G(f) = \{(x, y) \in \mathbb{R}^2 | \ x \in A, y = f(x)\}.$$

Some Examples

The composition of two functions

Assume f and g are two functions. The composition of f and g is defined by

$$(f_o g)(x) = f[g(x)],$$

provided $g(x)$ is in the domain of f.

Example 1 : $f(x) = \frac{x}{10-x}$, $g(x) = \frac{1}{x+2}$.

Example 2 : $f(x) = \sqrt{x}$, $g(x) = x^2 + 1$.

One-to-one function and inverse function

A function f one-to-one function if each element $y-$ value has exactly one $x-$ value. That is,

$$\text{if } f(x_1) = f(x_2) \text{ then } x_1 = x_2.$$

Example : $f(x) = \frac{x}{10-x}$.

Inverse functions

Let $f : A \to B$ is one-to-one function. The inverse function, denoted by f^{-1}, has domain $f(A)$ and range A is defined by

$$f^{-1}(y) = x.$$

Example 1 : $f(x) = x^2, x \geq 0$.
Example 1 : $y = f(x) = x^3 + 1, x \geq 0$.

Polynomial functions
Rational functions
Power functions
Exponential functions
Logarithmic functions
Trigonometric functions

THANK YOU VERY MUCH !