What is Next?

Dr. Abdulla Eid

College of Science

MATHS 103: Mathematics for Business I

MATHS 103 $\rightarrow$ MATHS 104

- MATHS 104 is all about functions!
- MATHS 104 is an introductory course to a branch of Mathematics called Calculus.

Calculus

Differentiation

- We want to find the derivative of a function, which is finding the slope of the tangent line to the graph of a function at a given point.

Integration

- We want to find the integrate a function, which is finding the area under the graph of a function on a given interval.

Note: We want to differentiate (integrate) all kind of functions. So in MATHS 104, the strategy will be

1. Find the derivative (integral) of the basic functions, e.g., x^n, c, e^x, a^x, $\ln x$, $\log_a x$.

2. Establish rules to find the derivative (integral) of the new functions from the basic ones, i.e., rules for the sum, difference, product, quotient, composite, inverse, etc.

Questions

Question 1 What is the relation between differentiation and integration? In other words, what is the relation between finding the slope of the tangent line and finding the area under the curve of a function?

Question 2 Why they are given together at the same course while they might look as two different branches of mathematics? (one measures the slope and the other measure the area)?

Answer The connection is given in the fundamental theorem of calculus which states (informally) that differentiation and integration are reversing each other! (In fact, both can be defined in terms of a limit!)

In MATHS 104, we will study

1. Limit of a function.
2. Derivative and its applications.
3. Integration and its applications.

Good Luck in your final exam