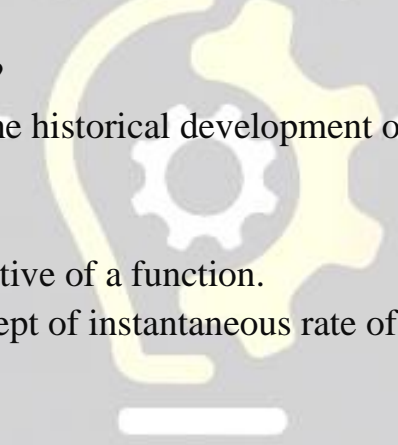# AIS Learning

A/L Combined Mathematics

Practice Tutorial

Lesson 01: Introduction To Calculus

1. Definition of Calculus:
   a. What is calculus?
   b. Briefly explain the historical development of calculus.

2. Differentiation:
   a. Define the derivative of a function.
   b. Explain the concept of instantaneous rate of change.

3. Limits:
   a. What is a limit in calculus?
   b. State the limit definition of the derivative.

4. Basic Derivatives:
   a. Find the derivative of the function
   $f(x)=3x^2 +2x-1.$
   b. What is the derivative of a constant?

5. Applications of Derivatives:
   a. Describe a real-world application of derivatives.

   b. If $s(t)=5t^2 +2t+1$ represents the position of an object at time t, what does
   s'(t) represent?

6. Integration:
   a. What is integration in calculus?
   b. Explain the difference between definite and indefinite integrals.

7. Basic Integrals:
   a. Find the integral of the function $g(x)=4x^3+2x^2-5$ with respect to x.
   b. What is the integral of a constant?

8. Fundamental Theorem of Calculus:
   a. State the Fundamental Theorem of Calculus.
   b. How is the definite integral related to the antiderivative?

9. Area under a Curve:
   a. Explain how the definite integral is used to find the area under a curve.
   b. Calculate the area under the curve:
      $y=x2$ from $x=0$ to $x=2$.

10. Calculus in Science:
    a. Provide an example of how calculus is used in science.
    b. How does calculus contribute to understanding motion and change?

Try those questions by yourself and submit your answers to us.
We can evaluate it for you!!!!
Happy Learning!!!!

-Evaluation Team AIS Learning