Comparison between Differentiation and Integration.

(1) Differentiation and integration both are operations on functions and each gives rise to a function.

(2) Each function is not differentiable or integrable.

(3) The derivative of a function, if it exists, is unique. The integral of a function, if it exists, is not unique.

(4) The derivative of a polynomial function decreases its degree by 1, but the integral of a polynomial function increases its degree by 1.

(5) The derivative has a geometrical meaning, namely, the slope of the tangent to a curve at a point on it. The integral has also a geometrical meaning, namely, the area of some region.

(6) The derivative is used in obtaining some physical quantities like velocity, acceleration etc. of a particle. The integral is used in obtaining some physical quantities like centre of mass, momentum etc.

(7) Differentiation and integration are inverse of each other.