★ Improvement Paper ★

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Application of Derivatives :-

Overview: We use derivatives to find extreme values of functions, to predict and analyze the shapes of graphs, to find replacements for complicated formulas, to determine how sensitive formulas are to errors in ~~replacements~~ measurement, and to find the zeros of functions numerically.

Applications:

1) The derivative is ~~the~~ exact rate at which one quantity changes with respect to another.

2) Geometrically, the derivative is ~~often~~ the slope of curve at the point on the curve.

3) The derivative is often called the "instantaneous" rate of change.

4) The derivative of a function represents an infinitely small change the function with respect to one of its variables.

☞ Some other applications of Derivatives

· Derivatives are also use to Calculate:

i) Rate of heat flow in Geology.

ii) Rate of improvement of performance in psychology

iii) Rate of the Spread of a rumor in sociology.

☞ Applications of Derivatives in various fields.

Such as in

Physics
Biology
Economics
Chemistry
Mathematics
other (Psychology, sociology & geology)

Application of Integration

Overview:

Many things we want to know can be calculated with integrals: the areas between curves, the volumes and surface areas of solids, the lengths of curves, the amount of work it takes to pump liquids from belowground, the forces against floodgates, the coordinates of the points where solid objects will balance. We define all of these as limits of Riemann sums of continuous functions on closed intervals, that is, as integrals, and evaluate these limits with Calculus.

There is a pattern to how we define the integrals in applications, a pattern that, once learned, enables us to define new integrals when we need them. We look at specific application first, then examine the pattern and show how it leads to integrals in new situations.

Application:

1) Area Between Curves:-

This Section shows how to find the areas of regions in the Coordinate Plane by integrating the functions that define the regions boundries.

Formula:

$$A = \int_a^b [f(x) - g(x)]\,dx$$

2) Distance, Velocity, Acceration

3) Volume

4) Average Value of a function

5) Work

6) Center of Mass

7) Kinetic energy ; Improper Integrals

8) Probability

9) Are length.

10) Surface Area.

Application of derivative and integration in Civil engineering:

The design and maintance of public works such as roads, bridges, water, energy systems, ports railways, and airports.

We use the derivative to determine the maximum and minimum values of particular function (eg. cost, strength, amount of material used in building, profit, loss etc). Derivatives are met in many engineering & science problems, especially when modelling the behaviour of moving objects.