

Assignment # 1

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Subject:- Applied Calculus

Dept:- Civil Engineering

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Q. Write application of derivatives & integration in Engineering.

Application of Derivatives:

★ We use the derivative to determine the maxima & minimum values of particular functions (eg: cost, strength, amount of material used in a building, profit, loss etc).

★ Derivatives are met in many engineering and science problems, especially when modeling the behaviour of moving objects.

★ It is also used in the design and maintenance of public works such as roads, bridges, water, energy systems.

ports, railways and airports.

★ Derivatives describe rate of change of a differentiable function. Simple cases include rates of expansion of material with temperature, complex ones to do solution of ordinary or partial differential equations in resonant frequencies and motions.

★ To make things short & clear, the formulae and tables that you see in the building codes are actually derived using continuum mechanics. Differentials are the core of continuum mechanics.

Application of Integration :-

- 1) It is used to determine shear force and bending moment.
- 2) It is used to determine length of curve.
- 3) It is used to determine area under a curve.
- 4) It is used to determine volume of solids of Revolution.
- 5) It is used to determine moments of inertia.
- 6) It is used to determine centroid of an area.
- 7) It is used to determine the surface area.