


# Application Of Partial <sup>①</sup>

## Differential Equation :-

\*  PDEs (partial differential equation) has many applications in many fields. The equations involving partial derivatives are known as partial differential equations (PDEs).

### Application:

#### \* In daily life:

→ Partial derivatives are used in the basic laws of physics for example Newton's laws of linear motion, Maxwell's equations of Electromagnetism and Einstein's equation in General Relativity.

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\* In Economics field ::

In the field of economics we use partial differential equation (derivative) to check what happens to other variables while keeping one variable constant.

\* In the field of Civil Engineering ::

→ Differential equations are the true essence of the physical world. They are used to describe the physical phenomenon which is encountered at microscopic as well as macroscopic level.

→ Differential equations are extensively involved in Civil Engineering.

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→ As Civil Engineering mostly concerned with building structure and Geometrical shapes. So any work revolved around modeling structure, fluids, pollutants and more can be modeled using differential equations. If you have any complicated geometries, which most realistic problems have, you'll likely to use the said differential equations in an approximation framework like that of finite (Difference, volume, Element) to approximately figure out a solution to a problem you care about.

→ In the field of Mechanical Engineering:

→ There are different order of partial derivative describing the rate of changes of a function

representing real physical quantities. (4)

→ The use of the separation of variables technique to solve partial differential equations relating to heat conduction in solids and vibration of solids in multidimensional systems.

