Application of Differential Equation.

Differential equation is applied in various practical fields of life. It is used to define various physical laws and quantities. It is widely used in physics, chemistry, engineering etc.

Some important fields of application are;

(i) Rate of change

(ii) Geometrical problems etc.

Differential equation is used for finding the family of curves for which some conditions involving the derivatives are given.

Equation of the tangent at a point (x, y) to the curve $y = f(x)$ is given by $\quad Y - y = \dfrac{dy}{dx}(X - x)$

$\qquad$ ....(i)

and equation of normal at (x, y) is $\quad Y - y = -\dfrac{1}{\left(\dfrac{dy}{dx}\right)}(X - x)$

$\qquad$ ....(ii)

The tangent meets X-axis at $\left(x - \dfrac{y}{\left(\dfrac{dy}{dx}\right)}, 0 \right)$ and Y-axis at $\left(0, y - x\dfrac{dy}{dx} \right)$

The normal meets X-axis at $\left(x + y\dfrac{dy}{dx}, 0 \right)$ and Y-axis at $\left(0, y + \dfrac{x}{\left(\dfrac{dy}{dx}\right)} \right)$