



Tutorial – 01 – Differential Equations

Exercice 01 : Solve the following 1st order differential equations:

1) $y' = 2x - 1$

2) $e^{(-x^2+y)} \cdot y' = x$

3) $y' = 2y$

4) $xy' = -e^y$

5) $\sqrt{y^2 + 1} dx = xy dy$

6) $y' = \frac{2}{x} y$

7) $(1 - x^2)y' - xy^2 = 0$

8) $(1 + y) - 2y'\sqrt{x} = 0$

Exercice 02 : For each case, give the solution of the following equations that verify the initial conditions

1) $y' = (2x + 3)y$ with $y(1) = 2$

2) $(1 + e^x)yy' = e^x$, with $y(0) = 1$

Exercice 03 : Solve the following the homogenous differential equations:

1) $xdy = (x + y)dx$

2) $x^2 y' = xy - y^2$

3) $y' = -e^{\frac{y}{x}} + \frac{y}{x}$

4) $y' = \frac{2y}{x} - 1$

Exercice 04 : Solve the following 2nd order differential equations:

1) $y'' - 5y' + 4y = 0$

2) $y'' + 2y' + y = 0$

3) $y'' + 3y' + 2y = 0$

4) $y'' + 4y' + 4 = 0$