

NAME:

Home Work 12.

MAP 2302 - Differential Equations

Solve the following ODE:

1. $x^2y'' - 2xy' + 2y = x^3$; $x > 0$. Ans: $y = c_1x^2 + c_2x + \frac{1}{2}x^3$

2. $x^3y''' - 4x^2y'' + 8xy' - 8y = 4 \ln x$; $x > 0$. Ans: $c_1x + c_2x^2 + c_3x^4 - \frac{7}{8} - \frac{1}{2} \ln x$

3. $x^3y''' - x^2y'' - 2xy' - 4y = 0$; $x > 0$. Ans: $c_1x^4 + c_2 \cos(\ln x) + c_3 \sin(\ln x)$

4. $2x^2y'' - 3xy' - 3y = 0$; $x \neq 0$.

Ans: $c_1x^{-\frac{1}{2}} + c_2x^3$; $x > 0$ and $c_1(-x)^{-\frac{1}{2}} + c_2x^3$; $x < 0$.