

Problems and Solution:

Find the general solution for ODE:

$$\textcircled{1} \quad 10y'' - 7y' + 1.2y = 0$$

Solution:

$$10y'' - 7y' + 1.2y = 0 \quad] \div 10$$

$$y'' - 0.7y' + 0.12y = 0$$

$$D^2 - 0.7D + 0.12 = 0$$

$$(D - 0.4)(D - 0.3) = 0$$

has the roots 0.4 and 0.3, So the general solution:

$$y = C_1 e^{0.4x} + C_2 e^{0.3x}$$

$$\textcircled{2} \quad y'' + 4\pi y' + 4\pi^2 y = 0$$

Solution:

The characteristic equation:

$$D^2 + 4\pi D + 4\pi^2 = 0$$

$$(D + 2\pi)^2 = 0$$

* has the double root (-2π) , so that the corresponding general solution is

$$y = (C_1 + C_2 x) e^{-2\pi x}$$

Find the ODE:

$$y'' + ay' + by = 0 \text{ for the}$$

given basis:

$$e^{0.5x}, e^{-3.5x}$$

في حالة اعطاء
الحل والمطلوب
ايضا المعادلة التفاضلية
ODE

Solution:

To the given basis there corresponding to the characteristic equation:

$$(D - 0.5)(D + 3.5) = 0$$

$$D^2 + 3D - 1.75 = 0$$

So, the ODE is

$$y'' + 3y' - 1.75y = 0$$

④ given basis: $1, e^{-3x}$

Solution:

The ch/c. equ. is: $D(D+3) = 0$

$$D^2 + 3D = 0$$

gives the ODE:

$$y'' + 3y' = 0$$

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