

Diferansiyel denklemler

المعادلات التي فيها الاشتقاق

$$y' = \frac{dy}{dx} \Rightarrow y' + 3xy = 0 \checkmark$$

$$\frac{d^2y}{dx^2} + 5y' - 2xy = 0 \checkmark$$

$$y''' + 5y' - 4xy = 0 \checkmark$$

$$7x + y = 10 \Rightarrow \text{dif deq'ldir}$$

$$f(x) = x^3 \Rightarrow \text{dif deq'ldir}$$

المعادلات: كاسي الاشتقاق المرفوع

$$y' = 2x + 5 \Rightarrow y = ?$$

$$\int dy = \int (2x + 5) dx$$

$$y = \frac{2x^2}{2} + 5x + C$$

$$y = x^2 + 5x + C$$

$$y'' + 6xy' - x = 0$$

$$y' - 5xy = e^x \Rightarrow y = ?$$

النوع الكلاسيكي
(تفصيل)

- 1) Adi dif. - kısmi dif ✓
- 2) Derece - mertebesi ✓
- 3) Linear - linear olmayan ✓
- 4) Homogen - homogen olmayan ✓

Adi dif

$$\frac{dy}{dx} = y'$$

$$\frac{d^2y}{dx^2} = y''$$

$$y' = e^x$$

$$y' - 4x = \sin x$$

Kısmi dif

$$\frac{\partial f}{\partial x} = y_x$$

$$\frac{\partial^2 f}{\partial x^2} = y_{xx}$$

$$y_x - 3xy = 5$$

$$y_{xx} - y_x = e^{xy}$$

dif derecesi

dif mertebesi

$$y' - 5xy = 0$$

1

1

$$y'' - y' = 0$$

1

2

$$(y''')^5 - 3y'' + 4y' = x \quad 5$$

3

3) Linear

Linear olmayan

* y ve y' ifadelerinin vssü alınır. So
Linearlik olmaz

$$\text{Örn) } y^4, (y')^3, \sqrt{y}$$

* y ile y' çarpma durumu
Linearlik olmaz

$$y \cdot y', y^2 \cdot y''$$

* $e^y, \sin(y), \cos(x+y)$

$$y''' + 5y'' - y' + 3y = x^2 \quad \checkmark \text{ linear dif}$$

$$y \cdot y' + 3x = e^x \quad \times \text{ linear değil}$$

$$y' - 5xy = y^2 \quad \times \quad // \quad //$$

$$y' + xy = e^{3x} \quad \checkmark \text{ linear}$$

$$y'' + 5y = \sin(y) \quad \text{linear değil,}$$

4) Homojen

Homojen Olmayan

★ اذا كان جميع الحدود في طرف الثاني من المعادلة "0" فهذه المعادلة هوميوجين

$$\frac{y''}{\sqrt{}} + \frac{3y'}{\sqrt{}} - \frac{5y}{\sqrt{}} = \frac{0}{\sqrt{}} \quad \text{Homojen}$$

$$\frac{y'}{\sqrt{}} - \frac{3xy}{\sqrt{}} = \frac{0}{\sqrt{}} \quad \text{Homojen}$$

$$\frac{x^5 y''}{\sqrt{}} - \frac{e^x y'}{\sqrt{}} + \frac{\sin x \cdot y}{\sqrt{}} = \frac{0}{\sqrt{}}$$

$$\frac{y''}{\sqrt{}} - \frac{4y'}{\sqrt{}} + \frac{x}{\sqrt{}} = 0 \quad x \rightarrow \text{Homojen değildir}$$

$$y'' - e^x y' = xy$$

$$\frac{y''}{\sqrt{}} - \frac{e^x y'}{\sqrt{}} - \frac{xy}{\sqrt{}} = 0 \quad \text{Homojen}$$

60-90 dk

السبح : 19:45

19:45 : 0 نكته

