Adveksi Mundur

Untuk memudahkan penjabaran, maka didefinisikan variabel sbb:

```
Cin1   = C(i,n+1)
Cin    = C(i,n)
Cminn  = C(i-1,n)
```

```
Adveksi:= (Cin1 - Cin)/Δt + U (Cin - Cminn)/Δx

Taylor:= { Cin1  -> Cin + ∂C∂t Δt + ∂2C∂t2 Δt^2/2,
           Cminn -> Cin - ∂C∂x Δx + ∂2C∂x2 Δx^2/2}

Identitas := ∂2C∂t2 -> U^2 ∂2C∂x2

AdveksiNew1 := Adveksi/.Taylor/.Identitas

AdveksiNew2 = ExpandAll[AdveksiNew1]
```

$$\frac{\partial C}{\partial t} + U\frac{\partial C}{\partial x} + \frac{U^2\,\partial^2 C/\partial x^2\,\Delta t}{2} - \frac{U\,\partial^2 C/\partial x^2\,\Delta x}{2}$$

```
AdveksiBaru := ∂C∂t + U ∂C∂x - Kn ∂2C∂x2;
        Kn := U Δx/2 - U^2 Δt/2

Selisih = Simplify[(AdveksiBaru - AdveksiNew2)/.Identitas]

0
```

Jika didefinisikan Cr = UΔt/Δx, maka kecepatan dapat ditulis sebagai:

```
Identitas3 := U ->   Cr Δx/Δt
```

sehingga Kn dapat ditulis sebagai:

```
Knbaru := Simplify[Kn /. Identitas3]; Knbaru
```

$$-\frac{(-1 + Cr)\,Cr\,\Delta x^2}{2\,\Delta t}$$

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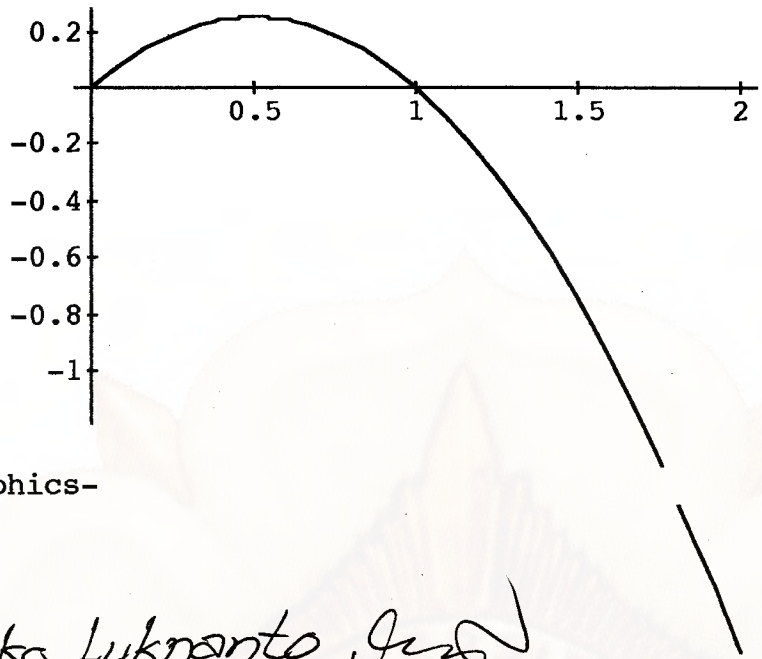
```
Plot[Knbaru/.{Δx->1,Δt->1/2},{Cr,0,2}]
```




```
-Graphics-
```

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