

## Integral – Integral Parsial (2)

Jika  $y = u v$  maka

$$\frac{dy}{dx} = v \frac{du}{dx} + u \frac{dv}{dx}$$

$$\Leftrightarrow dy = v \cdot du + u \cdot dv$$

$$\Leftrightarrow u \cdot dv = dy - v \cdot du$$

$$\Leftrightarrow \int u \cdot dv = \int (dy - v \cdot du)$$

$$\Leftrightarrow \int u \cdot dv = \int dy - \int v \cdot du$$

$$\Leftrightarrow \int u \cdot dv = y - \int v \cdot du$$

$$\Leftrightarrow \int u \cdot dv = uv - \int v \cdot du$$

Bentuk integral  $\int u \cdot dv = u \cdot v - \int v \cdot du$  disebut integral parsial

Contoh:

Tentukan  $\int 12x \sin 2x \, dx$

Jawab:

$$u = 12x \Rightarrow \frac{du}{dx} = 12 \Rightarrow du = 12dx$$

$$dv = \sin 2x \, dx \Rightarrow v = \int \sin 2x \, dx = -\frac{1}{2} \cos 2x$$

Sehingga,

$$\begin{aligned} \int 12x \sin 2x \, dx &= 12x \cdot \left(-\frac{1}{2} \cos 2x\right) - \int \left(-\frac{1}{2} \cos 2x\right) \cdot 12dx \\ &= -6x \cos 2x + \int 6 \cos 2x \, dx \\ &= -6x \cos 2x + 3 \sin 2x + c \end{aligned}$$