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Latihan Soal konvolusi 2 Dimensi

$x(n_1, n_2)$ * * $h(n_1, n_2)$ konvolusikan sinyal disamping

$$\begin{vmatrix} 1 & 4 & 1 \\ 2 & 5 & 3 \end{vmatrix}$$ $$\begin{vmatrix} 1 & 1 \\ 1 & -1 \end{vmatrix}$$

$$g(n_1, n_2) = \sum_{k_1=-\infty} \sum_{k_2=-\infty} x(k_1, k_2) h(n_1-k_1 \cdot n_2-k_2)$$

Cerminkan $h(n_1, n_2)$

$$\begin{array}{cc} -1 & 1 \\ 1 & 1 \end{array}$$ konvolusikan sinyalnya a

$$\begin{pmatrix}
\circ & \begin{array}{ccc} & 1 & 4 & 1 \\ -1 & (1 \cdot 2) & 5 & 3 \\ & 1 & 1 \end{array} \Rightarrow -1(0)+2 = \boxed{2} \\[3ex]
\circ & \begin{array}{ccc} & 1 & 4 & 1 \\ (-1 \cdot 3) & (1 \cdot 5) & 3 \\ & 1 & 1 \end{array} \rightarrow -1(2)+5 = \boxed{3} \\[3ex]
\bullet & \begin{array}{ccc} 1 & 4 & 1 \\ 2 & (+5 \cdot -1) & (3 \cdot 1) \\ & 1 & \end{array} \Rightarrow -5+3 = \boxed{-2} \\[3ex]
\bullet & \begin{array}{ccc} 1 & 4 & 1 \\ 2 & 5 & (-1 \cdot 3) & 1 \\ & 1 & 1 \end{array} \Rightarrow -3+0 = \boxed{-3}
\end{pmatrix}$$

- $-1(1\cdot 1)\ 4\ 1 \implies 1(1)+1(2)=\boxed{3}$
  $1\ (1\cdot 2)\ 5\ 3$

- ~~$\frac{4\cdot 1}{(-1\cdot 3)(1\cdot 5)\ 3}$~~ ~~$-(3)+3=3$~~

- $(-1\cdot 1)(1\cdot 4)(1)\ (1\cdot 2)\ (1\cdot 5)\ 3 \implies -1+4+2+5=\boxed{10}$

- $1\ (1\cdot 4)\ (1\cdot 1)\ 2\ (1\cdot 5)(1\cdot 3) \to -4+1+5+3=\boxed{5}$

- ~~$2\cdot 4\ (1\cdot 1)\ 3\ (1\cdot 5)(1\cdot 3)\ \neq\ -4+5+0+1$~~

- $1\quad 4(-1)\cdot 1\ 2\quad 5(1\cdot 3)\cdot 1 \implies -1+3+0=\boxed{2}$

- $-1\ 1$

- $1(1)\ 4\ 1\ 2\cdot 3 \to \boxed{1}$

- $(1\cdot 1)\ (4\cdot 1)\ (1) \to \boxed{5}$

- $-1\ (1\cdot 4)\ 1\cdot 1) \to \boxed{5}$

- $-1\ 4\ (1\cdot 4)\ 1 \to \boxed{4}$

$$g(n_1, n_2) = \begin{vmatrix} 1 & 5 & 5 & 4 \\ 3 & 10 & 5 & 2 \\ 2 & 3 & -2 & -3 \end{vmatrix}$$