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No
Date

Latihan Soal Convolution

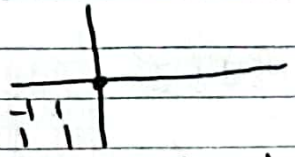
Diberikan:

$x(n_1, n_2)$

Konvolusikan sinyal tsb:

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

Langkah pertama, cerminkan $h(n_1, n_2)$ terhadap origin sehingga didapat:



sehingga konvolusikan sinyal sebagai berikut:

1 4 4 1
-1 (1·2) 5 3 ⟺ -1(0)+(2) ≡ 2
1 1

1 4 1
(-1·3) (1·5) 3 ⟺ -1(2)+5 ≡ 3
1 1

1 4 4 1
2 (-1·5) (1·3 (≡) -5+3 ≡ -2
1 1

1 4 1
2 5 (-1·3) 1 (≡) -3+1(0) ≡ -3
1 1

4 1
(1·1) 4 1 (≡) 1
2 3

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~~-1 1~~
~~1 (1.4) (1.1) (≡) 4+1≡5~~
~~2 5 3~~

- -1 (1.1) 4 1 (≡) 1(1)+1(2)≡3
  1 (1.2) 5 3
- (-1.1)(1.4) 1 (≡) -1+4+2+5≡10
  (1.2) (1.5) 3
- 1 (+4) (1.1) (≡) -1+4+2+5≡10
  2 (1.5) (1.3)
- 1 (+4) (1.1) (≡) -4+1+5+3≡5
  2 (1.5) (1.3)
- 1 4 (-1.1) 1 (≡) -1+3+0+0≡2
  2 5 (1.3) 1

- -1 1
  1 (1.1) 4 1 (≡) 1
  2 3
- -1 1
  (1.1) (4.1) 1 (≡) 1+4≡5
  2 5 3
- -1 1
  1 (1.4) (1.1) (≡) 4+1≡5
  2 5 3
- -1 1
  1 4 (1.4) 1 (≡) 4
  2 5 3

Hasil akhir:

$g(M_1, M_2) =$

1	5	5	4
3	10	5	2
2	3	-2	-3