



# PROGRAM STUDI TEKNIK INFORMATIKA

FAKULTAS TEKNOLOGI INFORMASI  
UNIVERSITAS KRISTEN SATYA WACANA

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## PORTOFOLIO TUGAS GRAFIKA KOMPUTER TUGAS 01 MATRIKS

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Tuliskan Jawaban Anda di Bawah ini! (bisa ditulis tangan lalu di scan/cam-scan atau langsung di tulis di bawah ini)

Matriks:  $A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$   $B = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix}$


BUKTIKAN

a)  $(AB)^T = B^T A^T$

$AB = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix} \cdot \begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix}$     
Matriks: Baris X Kolom

$$AB = \begin{pmatrix} 1.1 + 2.1 + 3.1 & 1.2 + 2.2 + 3.2 & 1.3 + 2.3 + 3.3 \\ 4.1 + 5.1 + 6.1 & 4.2 + 5.2 + 6.2 & 4.3 + 5.3 + 6.3 \\ 7.1 + 8.1 + 9.1 & 7.2 + 8.2 + 9.2 & 7.3 + 8.3 + 9.3 \end{pmatrix}$$

$$AB = \begin{pmatrix} 6 & 12 & 18 \\ 15 & 30 & 45 \\ 24 & 48 & 72 \end{pmatrix}$$

  $AB^T = \begin{pmatrix} 6 & 15 & 24 \\ 12 & 30 & 48 \\ 18 & 45 & 72 \end{pmatrix}$

## TRANSPOSE

Transpose merupakan bagian perputaran sehingga:

Baris Menjadi Kolom dan Kolom Menjadi Baris

$$AB = \begin{pmatrix} 6 & 12 & 18 \\ 15 & 30 & 45 \\ 24 & 48 & 72 \end{pmatrix} \quad AB^T = \begin{pmatrix} 6 & 15 & 24 \\ 12 & 30 & 48 \\ 18 & 45 & 72 \end{pmatrix}$$

Bagian yang ditandai adalah yang bertukar tempat/ Berputar.

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix} \quad B = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix} \quad \Rightarrow \quad A^T = \begin{pmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{pmatrix} \quad B^T = \begin{pmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ 3 & 3 & 3 \end{pmatrix}$$

$$B^T = \begin{pmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ 3 & 3 & 3 \end{pmatrix} \cdot A^T = \begin{pmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{pmatrix}$$

$$B^T A^T = \begin{pmatrix} 1.1 + 1.2 + 1.3 & 1.4 + 1.5 + 1.6 & 1.7 + 1.8 + 1.9 \\ 2.1 + 2.2 + 2.3 & 2.4 + 2.5 + 2.6 & 2.7 + 2.8 + 2.9 \\ 3.1 + 3.2 + 3.3 & 3.4 + 3.5 + 3.6 & 3.7 + 3.8 + 3.9 \end{pmatrix}$$

$$B^T A^T = \begin{pmatrix} 6 & 15 & 24 \\ 12 & 30 & 48 \\ 18 & 45 & 72 \end{pmatrix}$$

**PEMBUKTIAN**  
 $(AB)^T = B^T A^T$  ✓  
**ADALAH BENAR**

$$AB^T = \begin{pmatrix} 6 & 15 & 24 \\ 12 & 30 & 48 \\ 18 & 45 & 72 \end{pmatrix} = B^T A^T = \begin{pmatrix} 6 & 15 & 24 \\ 12 & 30 & 48 \\ 18 & 45 & 72 \end{pmatrix}$$

b)  $A(sB) = sAB$ , dimana  $s = 4$

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix} \quad 4B = \begin{pmatrix} 1.4 & 2.4 & 3.4 \\ 1.4 & 2.4 & 3.4 \\ 1.4 & 2.4 & 3.4 \end{pmatrix} \Rightarrow 4B = \begin{pmatrix} 4 & 8 & 12 \\ 4 & 8 & 12 \\ 4 & 8 & 12 \end{pmatrix}$$

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix} \cdot 4B = \begin{pmatrix} 4 & 8 & 12 \\ 4 & 8 & 12 \\ 4 & 8 & 12 \end{pmatrix}$$

$$A4B = \begin{pmatrix} 1.4 + 2.4 + 3.4 & 1.8 + 2.8 + 3.8 & 1.12 + 2.12 + 3.12 \\ 4.4 + 5.4 + 6.4 & 4.8 + 5.8 + 6.8 & 4.12 + 5.12 + 6.12 \\ 7.4 + 8.4 + 9.4 & 7.8 + 8.8 + 9.8 & 7.12 + 8.12 + 9.12 \end{pmatrix}$$

$$\Rightarrow A4B = \begin{pmatrix} 24 & 48 & 72 \\ 60 & 120 & 180 \\ 96 & 192 & 288 \end{pmatrix}$$

$$AB = \begin{pmatrix} 6 & 12 & 18 \\ 15 & 30 & 45 \\ 24 & 48 & 72 \end{pmatrix} \Rightarrow 4AB = \begin{pmatrix} 6.4 & 12.4 & 18.4 \\ 15.4 & 30.4 & 45.4 \\ 24.4 & 48.4 & 72.4 \end{pmatrix} = \begin{pmatrix} 24 & 48 & 72 \\ 60 & 120 & 180 \\ 96 & 192 & 288 \end{pmatrix}$$

**PEMBUKTIAN**  
 $A(sB) = sAB$ , dimana  $s = 4$  ✓  
**ADALAH BENAR**

$$A4B = \begin{pmatrix} 24 & 48 & 72 \\ 60 & 120 & 180 \\ 96 & 192 & 288 \end{pmatrix} = 4AB = \begin{pmatrix} 24 & 48 & 72 \\ 60 & 120 & 180 \\ 96 & 192 & 288 \end{pmatrix}$$

c) 
$$\begin{vmatrix} 2 & 0 & 6 \\ 8 & 1 & -4 \\ 0 & 5 & 7 \end{vmatrix} = 294 \quad \text{BUKTIKAN!}$$

Dengan Minor Kovaktor:

$$\begin{vmatrix} 2 & 0 & 6 \\ 8 & 1 & -4 \\ 0 & 5 & 7 \end{vmatrix} \rightarrow m_{11} \begin{vmatrix} 1 & -4 \\ 5 & 7 \end{vmatrix}$$

$$\begin{vmatrix} 2 & 0 & 6 \\ 8 & 1 & -4 \\ 0 & 5 & 7 \end{vmatrix} \rightarrow m_{22} \begin{vmatrix} 8 & -4 \\ 0 & 7 \end{vmatrix}$$

$$\begin{vmatrix} 2 & 0 & 6 \\ 8 & 1 & -4 \\ 0 & 5 & 7 \end{vmatrix} \rightarrow m_{33} \begin{vmatrix} 8 & 1 \\ 0 & 5 \end{vmatrix}$$

$$\begin{vmatrix} 2 & 0 & 6 \\ 8 & 1 & -4 \\ 0 & 5 & 7 \end{vmatrix} = m_{11} \begin{vmatrix} 1 & -4 \\ 5 & 7 \end{vmatrix} - m_{22} \begin{vmatrix} 8 & -4 \\ 0 & 7 \end{vmatrix} + m_{33} \begin{vmatrix} 8 & 1 \\ 0 & 5 \end{vmatrix}$$

$$= 2(-1)^{1+1} \begin{vmatrix} 1 & -4 \\ 5 & 7 \end{vmatrix} - 0(-1)^{1+2} \begin{vmatrix} 8 & -4 \\ 0 & 7 \end{vmatrix} + 6(-1)^{1+3} \begin{vmatrix} 8 & 1 \\ 0 & 5 \end{vmatrix}$$

$$= 2(7 - (-20)) - 0(56 - 0) + 6(40 - 0)$$

$$= 2(27) - 0(56) + 6(40)$$

$$= 54 - 0 + 240$$

$$= \underline{294} \text{ Jadi setelah daidapat jawabannya benar dan bisa dibuktikan.}$$