

No
Date

$$A^2 = A \cdot A$$

$$= \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & 4 & 5 \end{pmatrix} \cdot \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & 4 & 5 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 6 & 1 & 0 \\ 26 & 23 & 25 \end{pmatrix}$$

3. $\det(D) = 29$

$$D = \begin{pmatrix} 1 & 5 & k \\ -1 & 0 & 1 \\ 3 & k & 4 \end{pmatrix}$$

tentukan k

$$\det D = 1 \begin{vmatrix} 0 & 1 \\ k & 4 \end{vmatrix} - 5 \begin{vmatrix} -1 & 1 \\ 3 & 4 \end{vmatrix} + k \begin{vmatrix} -1 & 0 \\ 3 & k \end{vmatrix}$$

$$= 1(4) + 5 \cdot 7 - k \cdot (-k)$$

$$= -k + 35 - k^2 = 29$$

$$\Rightarrow -k^2 - k = 29 - 35 = -6$$

$$\Rightarrow -k^2 - k + 6 = 0$$

$$\Rightarrow k^2 + k - 6 = 0$$

$$k = \frac{-1 \pm \sqrt{1 + 24}}{2}$$

$$= k = \frac{-1 \pm 5}{2}$$

$$k = 2 \text{ atau } k = -3$$

4. diketahui matriks

$$A = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & 4 & 5 \end{pmatrix}$$

1. jika $B = A^{-1}$ dan A^t merupakan transpose beraturan

$$x = \frac{\det(2A^t) - \det(5B)}{\det(A^t B)}$$

peni

Tugas PR Determinan Matriks

No
Date

1. tentukan determinan dengan ekspansi kofaktor & B =

$$P = \begin{pmatrix} 2 & 1 & 1 \\ 1 & 2 & 1 \\ 1 & 1 & 2 \end{pmatrix} \quad Q = \begin{pmatrix} 3 & -2 & 0 \\ 0 & 1 & 0 \\ -4 & 4 & 1 \end{pmatrix}$$

$$\det(P) = 2 \begin{vmatrix} 2 & 1 \\ 1 & 2 \end{vmatrix} - 1 \begin{vmatrix} 1 & 1 \\ 1 & 2 \end{vmatrix} + 1 \begin{vmatrix} 1 & 2 \\ 1 & 1 \end{vmatrix}$$

$$= 2 \cdot 3 - 1 \cdot 1 + 1 \cdot (-1) = 6 - 1 - 1 = 4$$

$$\det(Q) = 3 \begin{vmatrix} 1 & 0 \\ 4 & 1 \end{vmatrix} - (-2) \begin{vmatrix} 0 & 0 \\ -4 & 1 \end{vmatrix} + 0 \begin{vmatrix} 0 & 1 \\ -4 & 4 \end{vmatrix}$$

$$= 3 \cdot 1 - (-2) \cdot 0 + 0 = 3$$

2.

$$A = \begin{pmatrix} 2 & 1 & 0 \\ 3 & 4 & 0 \\ 0 & 0 & 2 \end{pmatrix} \quad \text{dan} \quad B = \begin{pmatrix} 1 & -1 & 3 \\ 7 & 1 & 2 \\ 5 & 0 & 1 \end{pmatrix}$$

→ Unggulkan bahwa $\det(A) \det(B) = \det(AB)$

$$\det(A) = 2 \begin{vmatrix} 4 & 0 \\ 0 & 2 \end{vmatrix} - 1 \begin{vmatrix} 3 & 0 \\ 0 & 2 \end{vmatrix} + 0 \begin{vmatrix} 3 & 4 \\ 0 & 0 \end{vmatrix}$$

$$= 2 \cdot 8 - 1 \cdot 6 + 0 = 16 - 6 = 10$$

$$\det(B) = 1 \begin{vmatrix} 1 & 2 \\ 0 & 1 \end{vmatrix} - (-1) \begin{vmatrix} 7 & 2 \\ 5 & 1 \end{vmatrix} + 3 \begin{vmatrix} 7 & 1 \\ 5 & 0 \end{vmatrix}$$

$$= 1 \cdot 1 - (-1) \cdot (-3) + 3 \cdot (-5)$$

$$= 1 + 3 - 15 = -11$$

$$AB = \begin{pmatrix} 9 & -1 & 3 \\ 7 & 1 & 1 \\ 10 & 0 & 2 \end{pmatrix} \quad \det(AB) = 9 \begin{vmatrix} 1 & 1 \\ 0 & 2 \end{vmatrix} - 1 \begin{vmatrix} 3 & 1 \\ 10 & 2 \end{vmatrix} + 3 \begin{vmatrix} 3 & 1 \\ 10 & 0 \end{vmatrix}$$

$$= 9 \cdot 2 - 1 \cdot (-10) + 3 \cdot (-10) = 18 + 10 - 30 = -2$$

$$\det(A) \det(B) = 10 \cdot (-11) = -110 \quad \det(AB) = -2$$