MACIEJ SIKORA

31.03 gr 1

Zad 1 $\frac{\partial A}{\partial y} = 0$ macierz zer $A = \begin{bmatrix} 3 & 3 \\ 2 & 4 \end{bmatrix}$

$$L = \frac{\partial A}{\partial y} = \begin{bmatrix} \frac{\partial 3}{\partial y} & \frac{\partial 3}{\partial y} \\ \frac{\partial 2}{\partial y} & \frac{\partial 4}{\partial y} \end{bmatrix} = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} = P$$

Zad 2 $\frac{\partial \alpha X}{\partial y} = \alpha \frac{\partial X}{\partial y}$

$$\alpha X = \begin{bmatrix} 2 \cdot 3y & 2 \cdot 3 \cdot y^2 \\ 2 \cdot 2y^2 & 2 \cdot 4 \cdot y^3 \end{bmatrix}$$

$$L = \frac{\partial \begin{bmatrix} 6y & 6y^2 \\ 4y^2 & 8y^3 \end{bmatrix}}{\partial y} = \begin{bmatrix} 6 & 12y \\ 8y & 24y^2 \end{bmatrix}$$

$$P = 2 \frac{\partial \begin{bmatrix} 3y & 3y^2 \\ 2y^2 & 4y^3 \end{bmatrix}}{\partial y} = 2 \cdot \begin{bmatrix} 3 & 6y \\ 4y & 12y \end{bmatrix} = \begin{bmatrix} 6 & 12y \\ 8y & 24y^2 \end{bmatrix}$$

$L = P$

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Zad 3 $X = \begin{bmatrix} 3y & 3y^2 \\ 2y^2 & 4y^3 \end{bmatrix}$ $Y = X$

$$\frac{\partial(X \cdot Y)}{\partial y} = \frac{\partial X}{\partial y} + \frac{\partial Y}{\partial y}$$

$$L = \frac{\begin{bmatrix} 6y & 6y^2 \\ 4y^2 & 8y^3 \end{bmatrix}}{\partial y} = \begin{bmatrix} 6 & 12y \\ 8y & 24y^2 \end{bmatrix}$$

$$P = \begin{bmatrix} 3 & 6y \\ 4y & 12y \end{bmatrix} + \begin{bmatrix} 3 & 6y \\ 4y & 12y \end{bmatrix} =$$

$$\begin{bmatrix} 6 & 12y \\ 8y & 24y^2 \end{bmatrix} = L$$

C. n. u.

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Zad 4 $\frac{\partial tr(X)}{\partial y} = tr\frac{\partial X}{\partial y}$

$$L = \frac{\partial(3y + 4y^3)}{\partial y} = 3 + 12y^2$$

$$P = tr\begin{bmatrix} 3 & 6y \\ 4y & 12y^2 \end{bmatrix} = 3 + 12y^2$$

$L = P$

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Zad 5 $\frac{\partial XY}{\partial y} = \frac{\partial X}{\partial y} Y + X \frac{\partial Y}{\partial y}$

$\begin{bmatrix} 3y & 3y^2 \\ 2y^2 & 4y^3 \end{bmatrix}$

$XY = \begin{bmatrix} 3y & 3y^2 \\ 2y^2 & 4y^3 \end{bmatrix} =$

$\frac{\partial \begin{bmatrix} 6y^4 + 9y^2 & 12y^5 + 9y^3 \\ 8y^5 + 6y^3 & 16y^6 + 6y^4 \end{bmatrix}}{\partial y} =$

$\begin{bmatrix} 24y^3 + 18y & 60y^4 + 27y^2 \\ 40y^4 + 18y^2 & 96y^5 + 24y^3 \end{bmatrix}$

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Zad 5 c.d.

$$P = \frac{\partial \begin{bmatrix} 3y & 3y^2 \\ 2y^2 & 4y^3 \end{bmatrix}}{\partial y} \circ y + x \circ \frac{\partial \begin{bmatrix} 3y & 3y^2 \\ 2y^2 & 4y^3 \end{bmatrix}}{\partial y} =$$

$$\begin{bmatrix} 3 & 6y \\ 4y & 12y^2 \end{bmatrix} \begin{bmatrix} 3y & 3y^2 \\ 2y^2 & 4y^3 \end{bmatrix} + \begin{bmatrix} 3y & 3y^2 \\ 2y^2 & 4y^3 \end{bmatrix} \begin{bmatrix} 3 & 6y \\ 4y & 12y^2 \end{bmatrix} =$$

$$\begin{bmatrix} 9y + 12y^3 & 24y^4 + 9y^2 \\ 24y^4 + 12y^2 & 48y^5 + 12y^3 \end{bmatrix} + \begin{bmatrix} 12y^3 + 9y & 36y^4 + 18y^2 \\ 16y^4 + 6y^2 & 48y^5 + 12y^3 \end{bmatrix}$$

$$\begin{bmatrix} 24y^3 + 18y & 60y^4 + 27y^2 \\ 40y^4 + 18y^2 & 96y^5 + 24y^3 \end{bmatrix}$$

$L = P$ c.n.u.