

ocena  
końcowa  
ze  
studium

$$\text{dyskretyzacja} \Rightarrow \sum_{i=1}^3 w_i x_i = w_1 x_1 + w_2 x_2 + w_3 x_3 \equiv \langle w, x \rangle$$

0.6  $\uparrow$   $w_1$  średnia ocen z wszystkich kursów  
0.2  $\uparrow$   $w_2$  ocena z pracy dyplom.  
0.2  $\uparrow$   $w_3$  ocena z egzaminu dypl.

$\{x_i\}$   
 $\max_i \{x_i\}$

set()

max

min

np. min

np. max

sum

np. sum

$$\text{ryzyko} = w_1 \underbrace{\text{10k}}_{\text{10k}} + w_2 \underbrace{\text{5k}}_{\text{5k}} + w_3 \underbrace{\text{1k}}_{\text{1k}}$$

$$w_i \leftarrow \frac{w_i}{\sum_i w_i}$$

i \ j	1	2	3	4	5	N
1						
2						
3						
...						
M						

$x_{ij}$

$x[i][j]$

$x[i, j]$

$\Pi \Sigma$

$w = \begin{bmatrix} 0.6 & 0.2 & 0.2 \end{bmatrix}$   
wiersz

$w[0, i]$

$w[i, 0]$

$w = \begin{bmatrix} 0.6 \\ 0.2 \\ 0.2 \end{bmatrix}$   
kolumna

$$w = \begin{bmatrix} w_1 \\ w_2 \\ w_3 \end{bmatrix}$$

$$x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

$$\text{sum}([w[i] * x[i] \text{ for } i \text{ in range}(\text{len}(x))])$$

$$\text{sum}(w * x) \leftarrow \text{dlż array}$$

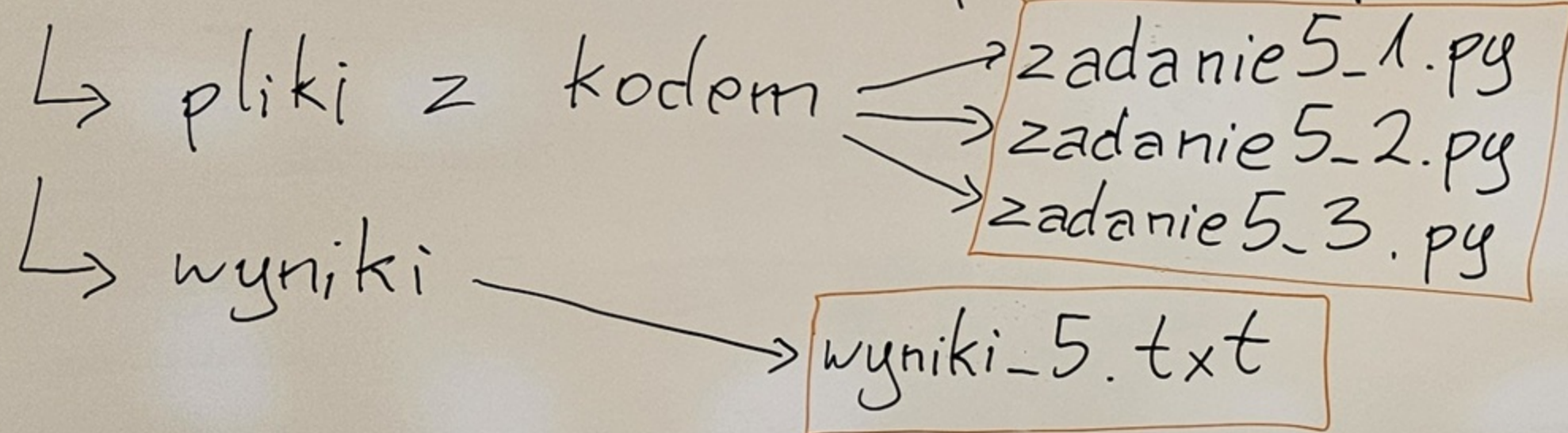
$$\text{np.dot}(w, x)$$

$$w = [w_1 \ w_2 \ w_3]$$

$$x = [x_1 \ x_2 \ x_3]$$



jaroslaw.drapala@pwr.edu.pl



byes.pl

↳ ALO

↳ tajemniczy plik

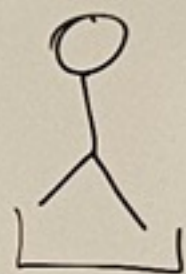
VS Code (nie Jupyter!)

pierwsze (początkowe) pokolenie  
ma numer 1

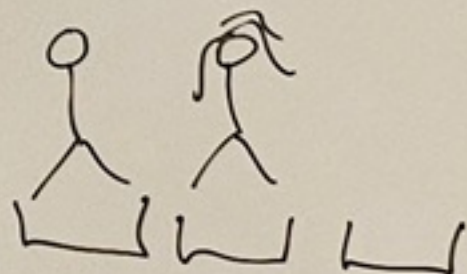
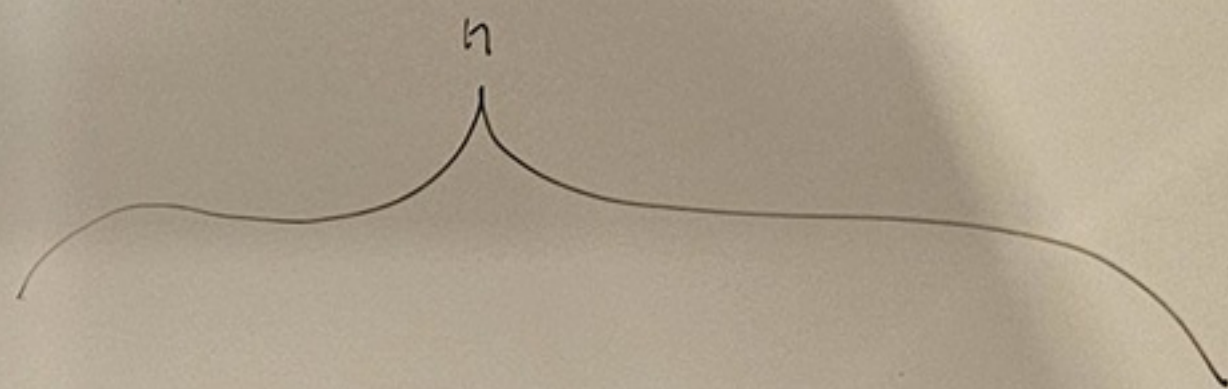
wyniki na byes.pl → ALO do niedzieli wieczorem najpóźniej



1

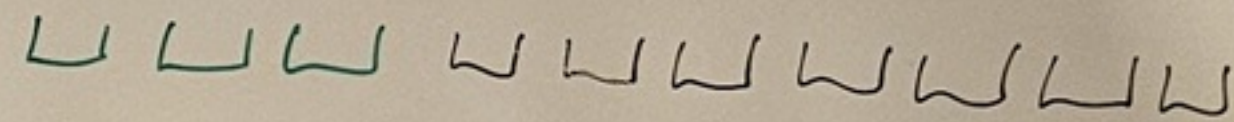
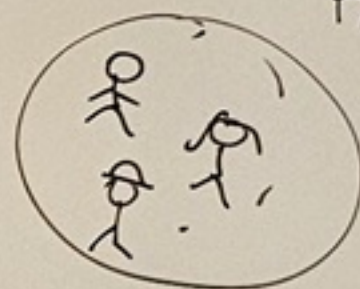
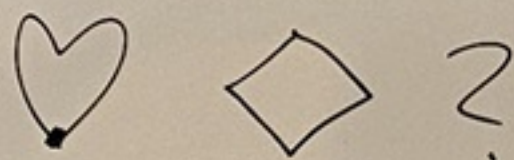


2

 $n!$ 

$$\frac{n!}{k! (n-k)!} = \binom{n}{k}$$

$$p = \frac{1}{\binom{49}{6}}$$

 $n-k$  $n$ -elementów $k$ -podgrupa $N$ 

	os 1	os 2	
os 1	.	m <sub>3</sub>	m <sub>3</sub>
		.	B
			.

← uściski  
dłoni

W domu  
A karimi B

ile możliwych  
karmień

$$\frac{N^2 - N}{2}$$



W domu  
prawd trafienia  
3-ki  
4-ki



? ♥ ◇ ??? [1, 3]^1

1 ♥ ◇

$$ax^2 + bx + c = 0$$

3 ♥ ♥ ♥ ◇

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x^5 - x^3 + 2x +$$

$$rk(4x^2 - 2x + 3) = 0$$

$\sqrt{2}$

pk(2)

1.41

$$x=0$$

$$3=0$$

$$x=1$$

$$5=0$$

$$x=-1$$

$$7=0$$

$$x=\frac{1}{2}$$

$$3=0$$

x=



W domu

$$w = [4, -1, 3, \dots]$$

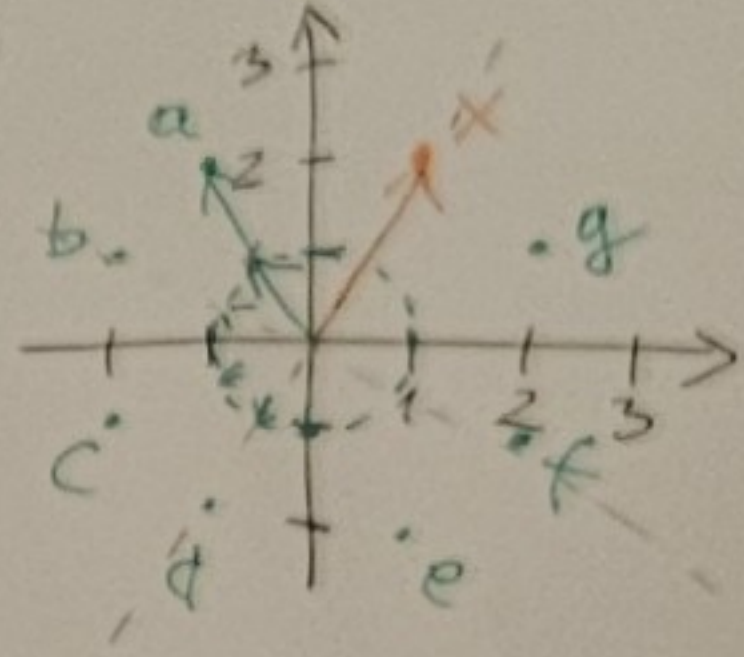
$$x = [-1, 0, 2, \dots]$$

$$\begin{bmatrix} 4 \\ -1 \\ 3 \end{bmatrix} \cdot \begin{bmatrix} -1 \\ 0 \\ 2 \end{bmatrix}$$

il\_skar = [lista skladana] 1 wersja

petla for 2 wersja

$$\langle \cdot, \cdot \rangle \rightarrow 0$$



$$\langle \cdot, \cdot \rangle \rightarrow \max$$

$$x = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$$

$$\left\langle \begin{bmatrix} 1 \\ 2 \end{bmatrix}, \begin{bmatrix} -1 \\ 2 \end{bmatrix} \right\rangle = 1 \cdot (-1) + 2 \cdot 2 = -1 + 4 = 3$$

$$\langle x, x \rangle = 5/\sqrt{5}$$

$$\langle x, a \rangle = 3/\sqrt{5}$$

$$\langle x, b \rangle = 0/\sqrt{5}$$

$$\langle x, c \rangle = -4/\sqrt{5}$$

$$\langle x, d \rangle = -5/\sqrt{5}$$

$$\langle x, e \rangle = -3/\sqrt{5}$$

$$\langle x, f \rangle = 0/\sqrt{5}$$

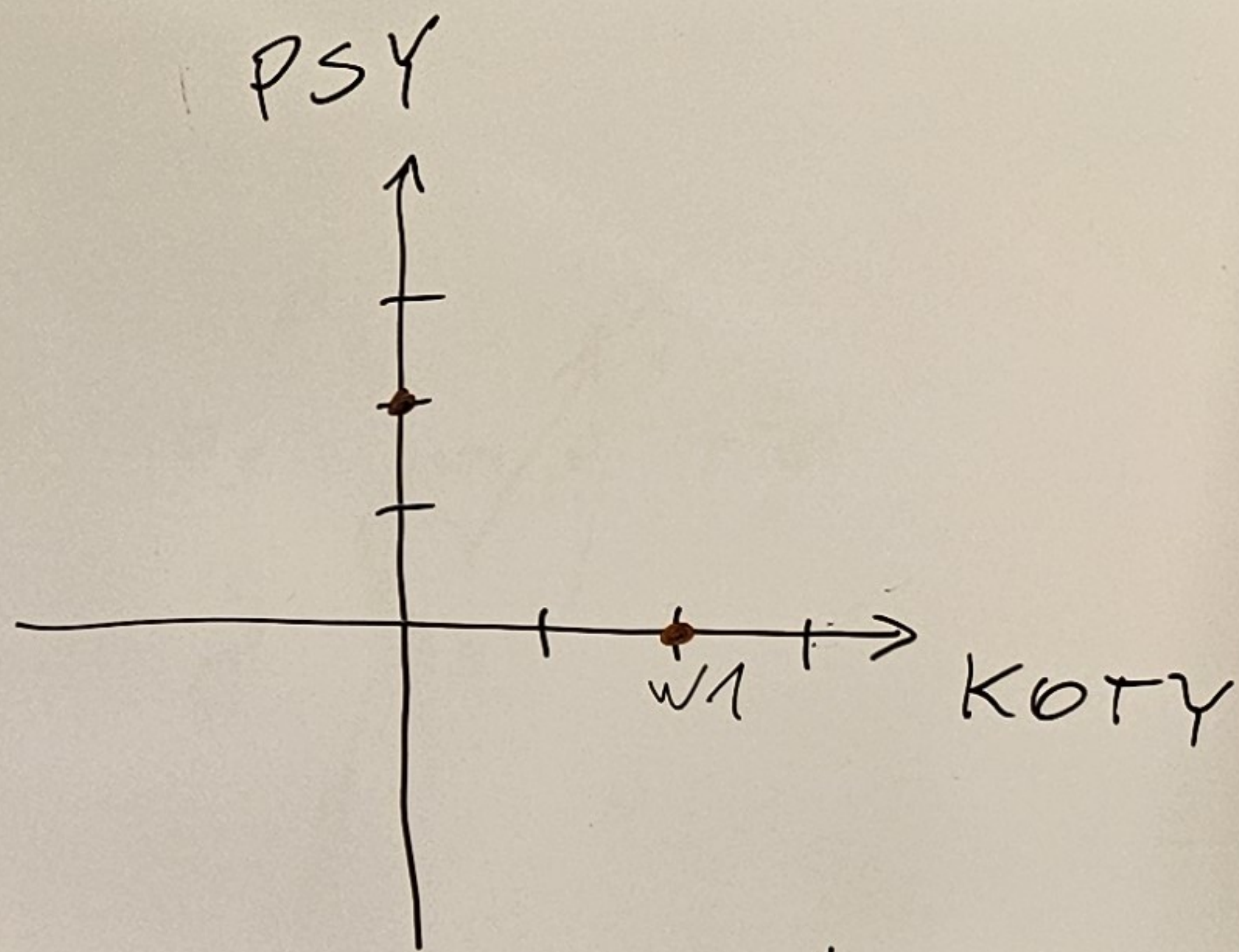
$$\langle x, g \rangle = 4/\sqrt{5}$$

$$d = -x$$

unormowane wektory:  
ma dlugosc 1

$$|b| \cdot |a| \cos \alpha = \langle x, g \rangle$$





$$w_1 = \begin{bmatrix} 2 \\ 0 \end{bmatrix} = a \cdot \text{KOTY} + b \cdot \text{PSY}$$

$$w_2 = \begin{bmatrix} 0 \\ 2 \end{bmatrix} = c \cdot \text{KOTY} + d \cdot \text{PSY}$$

$$(a \cdot \text{KOTY} + b \cdot \text{PSY}) + (c \cdot \text{KOTY} + d \cdot \text{PSY}) = (a+c) \cdot \text{KOTY} + (b+d) \cdot \text{PSY}$$

$$(a \cdot \text{KOTY} + b \cdot \text{PSY}) \cdot (c \cdot \text{KOTY} + d \cdot \text{PSY}) = a \cdot c \cdot \text{KOTY}^2 + b \cdot d \cdot \text{PSY}^2 + (ad+bc) \cdot \text{KOTY} \cdot \text{PSY}$$

$$\text{KOTY}^2 = \text{KOTY}$$

$$\text{PSY}^2 = -\text{KOTY}$$

$$\text{KOTY} \cdot \text{PSY} = \text{PSY}$$

$$= a \cdot c \cdot \text{KOTY} - b \cdot d \cdot \text{KOTY} + \dots$$

$$= (ac - bd) \cdot \text{KOTY} + (ad + bc) \cdot \text{PSY}$$