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> restart: with(linalg):
> print('-----');
> print('GAUSS_JORDAN_ELIMINACIO');
> print('-----');
> A := matrix([[2, 4, 8, 16], [1, 2, 7, 15], [0, 0, 6, 14]]);
> print('UAZ_MINT_AMINEK_ALT_INV_ET_SZAMOLTUK');
> print('___');
> print('CEL___SORELIMINACIOVAL_MINEL_TOBB_KULONBOZO_EGYSEG_OSZLOPVEKTOR');
> print('JO_SORREND BEN');
> print('___');
> print('ELSO_SOR_MINUS_2x_MASODIK');
> A1:=matrix([[0, 0, -6, -14], [1, 2, 7, 15], [0, 0, 6, 14]]);
> print('ELSO_OSZLOP_JO');
> print('___');
> print('HARMADIK_SOR_PLUS_ELSO');
> A2 := matrix([[0, 0, -6, -14], [1, 2, 7, 15], [0, 0, 0, 0]]);
> print('ELSO_SORx', (-1/6));
> A3 := matrix([[0, 0, 1, 7/3], [1, 2, 7, 15], [0, 0, 0, 0]]);
> print('MASODIK_SOR_MINUS_7x_ELSO');
> A4 := matrix([[0, 0, 1, 7/3], [1, 2, 0, -4/3], [0, 0, 0, 0]]);
> print('HARMADIK_OSZLOP_JO');
> print('TOVABB_NINCS');
> print('___');
> print('EGYSEGVEKKTOROK_JO_SORRENDJE_IS_KELL');
> print('ELSO_MASODIK_SOR_CSEREJE');
> A5 := matrix([[1, 2, 0, -4/3], [0, 0, 1, 7/3], [0, 0, 0, 0]]);
> print('___');
> print('MILYEN_MATRIX_SZORZASSAL_KAPJUK_EZT');
> L1:=matrix([[1,-2,0],[0,1,0],[0,0,1]]):
> print(A1=L1*A_, '-----', L1=evalm(L1));
> L2:=matrix([[1,0,0],[0,1,0],[1,0,1]]):
> print(A2=L2*A1_, '-----', L2=evalm(L2));
> L3:=matrix([[1/6,0,0],[0,1,0],[0,0,1]]):
> print(A3=L3*A2_, '-----', L3=evalm(L3));
> L4:=matrix([[1,0,0],[-7,1,0],[0,0,1]]):
> print(A4=L4*A3_, '-----', L4=evalm(L4));
> L5:=matrix([[0,1,0],[1,0,0],[0,0,1]]):
> print(A5=L5*A4_, '-----', L5=evalm(L5));
> print('___');
> A5=L5*L4*L3*L2*L1*A;
> A_=L1inv*L2inv*L3inv*L4inv*L5inv*A5;
> A_=evalm(inverse(L1))*evalm(inverse(L2))*evalm(inverse(L3))*evalm(i
> nverse(L4))*evalm(inverse(L5))*evalm(A5);
> Linv:=evalm(inverse(L1))*inverse(L2))*inverse(L3))*inverse(L4))*invers
> e(L5)):
> evalm(A)=evalm(Linv))*evalm(A5);
> print('___');
> print('A_SORAI_LIN_KOMBINACIOI_A5_ELSO_KET_SORANAK!');
> print('ELLENORZES__', evalm(A-matrix([[2, 8, 0], [1, 7, 0], [0,
6,
> 1]])&*matrix([[1, 2, 0, -4/3], [0, 0, 1, 7/3], [0, 0, 0, 0]])));
> print('___');

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Warning, new definition for norm

Warning, new definition for trace

GAUSS_JORDAN_ELIMINACIO

$$A := \begin{bmatrix} 2 & 4 & 8 & 16 \\ 1 & 2 & 7 & 15 \\ 0 & 0 & 6 & 14 \end{bmatrix}$$

UAZ_MINT_AMINEK_ALT_INV_ET_SZAMOLTUK

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*CEL___SORELIMINACIOVAL_MINEL_TOBB_KULONBOZO_EGYSEG_OSZL\
OPVEKTOR_JO_SORREND BEN*

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ELSO_SOR_MINUS_2x_MASODIK

$$A1 := \begin{bmatrix} 0 & 0 & -6 & -14 \\ 1 & 2 & 7 & 15 \\ 0 & 0 & 6 & 14 \end{bmatrix}$$

ELSO_OSZLOP_JO

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HARMADIK_SOR_PLUS_ELSO

$$A2 := \begin{bmatrix} 0 & 0 & -6 & -14 \\ 1 & 2 & 7 & 15 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

$$ELSO_SORx, \frac{-1}{6}$$

$$A3 := \begin{bmatrix} 0 & 0 & 1 & \frac{7}{3} \\ 1 & 2 & 7 & 15 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

MASODIK_SOR_MINUS_7x_ELSO

$$A4 := \begin{bmatrix} 0 & 0 & 1 & \frac{7}{3} \\ 1 & 2 & 0 & \frac{-4}{3} \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

HARMADIK_OSZLOP_JO

TOVABB_NINCS

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EGYSEGVEKKTOROK_JO_SORRENDJE_IS_KELL

ELSO MASODIK SOR CSEREJE

$$A5 := \begin{bmatrix} 1 & 2 & 0 & \frac{-4}{3} \\ 0 & 0 & 1 & \frac{7}{3} \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

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MILYEN MATRIX SZORZASSAL KAPJUK EZT

$$A1_- = L1_- A_-, \text{ -----}, L1_- = \begin{bmatrix} 1 & -2 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$A2_- = L2_- A1_-, \text{ -----}, L2_- = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$$

$$A3_- = L3_- A2_-, \text{ -----}, L3_- = \begin{bmatrix} \frac{-1}{6} & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$A4_- = L4_- A3_-, \text{ -----}, L4_- = \begin{bmatrix} 1 & 0 & 0 \\ -7 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$A5_- = L5_- A4_-, \text{ -----}, L5_- = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

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$$A5_ = L5_L4_L3_L2_L1_A$$

$$A_ = L1inv\,L2inv\,L3inv\,L4inv\,L5inv\,A5$$

$$A_ = \left(\left(\left(\left(\left[\begin{smallmatrix} 1 & 2 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{smallmatrix}\right] \&*\left[\begin{smallmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -1 & 0 & 1 \end{smallmatrix}\right]\right)\&*\left[\begin{smallmatrix} -6 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{smallmatrix}\right]\right)\&*\left[\begin{smallmatrix} 1 & 0 & 0 \\ 7 & 1 & 0 \\ 0 & 0 & 1 \end{smallmatrix}\right]\right)\&*\left[\begin{smallmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{smallmatrix}\right]\right)\left[\begin{smallmatrix} 1 & 2 & 0 & \frac{-4}{3} \\ 0 & 0 & 1 & \frac{7}{3} \\ 0 & 0 & 0 & 0 \end{smallmatrix}\right]$$

$$\left[\begin{smallmatrix} 2 & 4 & 8 & 16 \\ 1 & 2 & 7 & 15 \\ 0 & 0 & 6 & 14 \end{smallmatrix}\right] = \left[\begin{smallmatrix} 2 & 8 & 0 \\ 1 & 7 & 0 \\ 0 & 6 & 1 \end{smallmatrix}\right] \&*\left[\begin{smallmatrix} 1 & 2 & 0 & \frac{-4}{3} \\ 0 & 0 & 1 & \frac{7}{3} \\ 0 & 0 & 0 & 0 \end{smallmatrix}\right]$$

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$$A_SORAI_LIN_KOMBINACIOI_A5_ELSO_KET_SORANAK_!$$

$$ELLENORZES_,\left[\begin{smallmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{smallmatrix}\right]$$

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> restart: with(linalg):
> print('-----');
> print('FROBENIUS_FELBONTAS');
> print('-----');
> A := matrix([[2, 4, 8, 16], [1, 2, 7, 15], [0, 0, 6, 14]]);
> F1:=matrix([[1, 2, 0, -4/3], [0, 0, 1, 7/3]]);
> print('LATTUK__A_SORAI_F1_SORAIBOL_LIN_KOMB');
> print('__');
> print('FROBENIUS_ESZREVETELE');
> A:=F0_*F1;
> evalm(A)=matrix([[a,b],[c,d],[e,f]])&evalm(F1);
> print(a,c,d,e,f,'__Linv_NELKUL_IS_MEGY');
> matrix([[a,b],[c,d],[e,f]])&evalm(F1)=evalm(
> matrix([[a,b],[c,d],[e,f]])&*F1);
> print('__');
> matrix([[a,b],[c,d],[e,f]])&evalm(F1)=matrix([[a,x,b,x],[c,x,d,x],[e,
> x,f,x]]);
> print('AHOL_F1_EGYSEGVEKTORAI_OTT_',a,b,c,d,e,f);
> matrix([[2, 4, 8, 16], [1, 2, 7, 15], [0, 0, 6,
> 14]])=matrix([[a,x,b,x],[c,x,d,x],[e,x,f,x]]);
> matrix([[a,b],[c,d],[e,f]])=matrix([[2, 8], [1, 7], [0, 6]]);

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Warning, new definition for norm

Warning, new definition for trace

FROBENIUS_FELBONTAS

$$A := \begin{bmatrix} 2 & 4 & 8 & 16 \\ 1 & 2 & 7 & 15 \\ 0 & 0 & 6 & 14 \end{bmatrix}$$

$$F1 := \begin{bmatrix} 1 & 2 & 0 & \frac{-4}{3} \\ 0 & 0 & 1 & \frac{7}{3} \end{bmatrix}$$

LATTUK__A_SORAI_F1_SORAIBOL_LIN_KOMB

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FROBENIUS_ESZREVETELE

$$A_{-}=F0_{-}F1$$

$$\left[\begin{array}{cccc}2&4&8&16\\1&2&7&15\\0&0&6&14\end{array}\right]=\left[\begin{array}{cc}a&b\\c&d\\e&f\end{array}\right]\&{*}\left[\begin{array}{cccc}1&2&0&\frac{-4}{3}\\0&0&1&\frac{7}{3}\end{array}\right]$$

a, c, d, e, f, --Linv_NELKUL-IS_MEGY

$$\left[\begin{array}{cc}a&b\\c&d\\e&f\end{array}\right]\&{*}\left[\begin{array}{cccc}1&2&0&\frac{-4}{3}\\0&0&1&\frac{7}{3}\end{array}\right]=\left[\begin{array}{cccc}a&2a&b&-\frac{4}{3}a+\frac{7}{3}b\\c&2c&d&-\frac{4}{3}c+\frac{7}{3}d\\e&2e&f&-\frac{4}{3}e+\frac{7}{3}f\end{array}\right]$$

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$$\left[\begin{array}{cc}a&b\\c&d\\e&f\end{array}\right]\&{*}\left[\begin{array}{cccc}1&2&0&\frac{-4}{3}\\0&0&1&\frac{7}{3}\end{array}\right]=\left[\begin{array}{cccc}a&x&b&x\\c&x&d&x\\e&x&f&x\end{array}\right]$$

AHOL_F1_EGYSEGVEKTORAI_OTT-, a, b, c, d, e, f

$$\left[\begin{array}{cccc}2&4&8&16\\1&2&7&15\\0&0&6&14\end{array}\right]=\left[\begin{array}{cccc}a&x&b&x\\c&x&d&x\\e&x&f&x\end{array}\right]$$

$$\begin{bmatrix} a & b \\ c & d \\ e & f \end{bmatrix} = \begin{bmatrix} 2 & 8 \\ 1 & 7 \\ 0 & 6 \end{bmatrix}$$

```
> restart: with(linalg):
> print('-----');
> print('ALT_INV_FROBENIUS_FELBONTASSAL');
> print('-----');
> A_=F0_*F1_;
> A:=matrix([[2, 4, 8, 16], [1, 2, 7, 15], [0, 0, 6, 14]]):
> F0:=matrix([[2, 8], [1, 7], [0, 6]]):
> F1:=matrix([[1, 2, 0, -4/3], [0, 0, 1, 7/3]]):
> evalm(A)=evalm(F0)*evalm(F1);
> print('__');
> print('ELMELET___',Ainv_=F1inv_*F0inv);
> print('__');
```

Warning, new definition for norm

Warning, new definition for trace

ALT_INV_FROBENIUS_FELBONTASSAL

$$A_ = F0_ F1_$$

$$\begin{bmatrix} 2 & 4 & 8 & 16 \\ 1 & 2 & 7 & 15 \\ 0 & 0 & 6 & 14 \end{bmatrix} = \begin{bmatrix} 2 & 8 \\ 1 & 7 \\ 0 & 6 \end{bmatrix} \&* \begin{bmatrix} 1 & 2 & 0 & \frac{-4}{3} \\ 0 & 0 & 1 & \frac{7}{3} \end{bmatrix}$$

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$$ELMELET___, Ainv_ = F1inv_ F0inv$$

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