```
> restart:
> with(linalg);
```

$[BlockDiagonal, GramSchmidt, JordanBlock, LUdecomp, QRdecomp, Wronskian, addcol,$ **(1)**

$\quad addrow, adj, adjoint, angle, augment, backsub, band, basis, bezout, blockmatrix, charmat,$

$\quad charpoly, cholesky, col, coldim, colspace, colspan, companion, concat, cond, copyinto,$

$\quad crossprod, curl, definite, delcols, delrows, det, diag, diverge, dotprod, eigenvals,$

$\quad eigenvalues, eigenvectors, eigenvects, entermatrix, equal, exponential, extend, ffgausselim,$

$\quad fibonacci, forwardsub, frobenius, gausselim, gaussjord, geneqns, genmatrix, grad,$

$\quad hadamard, hermite, hessian, hilbert, htranspose, ihermite, indexfunc, innerprod, intbasis,$

$\quad inverse, ismith, issimilar, iszero, jacobian, jordan, kernel, laplacian, leastsqrs, linsolve,$

$\quad matadd, matrix, minor, minpoly, mulcol, mulrow, multiply, norm, normalize, nullspace,$

$\quad orthog, permanent, pivot, potential, randmatrix, randvector, rank, ratform, row, rowdim,$

$\quad rowspace, rowspan, rref, scalarmul, singularvals, smith, stackmatrix, submatrix, subvector,$

$\quad sumbasis, swapcol, swaprow, sylvester, toeplitz, trace, transpose, vandermonde, vecpotent,$

$\quad vectdim, vector, wronskian]$

```
> A2:=matrix(2,2,[[0.3,0.5],[0.8,0.4]]);
```

$$A2 := \begin{bmatrix} 0.3 & 0.5 \\ 0.8 & 0.4 \end{bmatrix}$$ **(2)**

```
> E2:=diag(1,1);
```

$$E2 := \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$ **(3)**

```
> B2:=matadd(E2,-A2);
```

$$B2 := \begin{bmatrix} 0.7 & -0.5 \\ -0.8 & 0.6 \end{bmatrix}$$ **(4)**

```
> BB2:=inverse(B2);
```

$$BB2 := \begin{bmatrix} 30.00000000 & 25.00000000 \\ 40.00000000 & 35.00000000 \end{bmatrix}$$ **(5)**

```
> det(B2);
```

$$0.02$$ **(6)**

```
> bb211:=det(minor(B2,1,1))/det(B2);
```

$$bb211 := 30.00000000$$ **(7)**

```
> bb212:=-det(minor(B2,2,1))/det(B2);
```

$$bb212 := 25.00000000$$ **(8)**

```
> bb221:=-det(minor(B2,1,2))/det(B2);
```

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$$bb221 := 40.00000000 \tag{9}$$

> **bb222:=det(minor(B2,2,2))/det(B2);**

$$bb222 := 35.00000000 \tag{10}$$

> **Y2:=matrix(2,1,[320,80]);**

$$Y2 := \begin{bmatrix} 320 \\ 80 \end{bmatrix} \tag{11}$$

> **linsolve(B2,Y2);**

$$\begin{bmatrix} 11600. \\ 15600. \end{bmatrix} \tag{12}$$

> **multiply(BB2,Y2);**

$$\begin{bmatrix} 11600.00000 \\ 15600.00000 \end{bmatrix} \tag{13}$$

> **multiply(E2,Y2);**

$$\begin{bmatrix} 320 \\ 80 \end{bmatrix} \tag{14}$$

> **E7:=diag(1,1,1,1,1,1,1);**

$$E7 := \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \tag{15}$$

> **A7:=matrix(7,7,[[0.3, 0.1, 0.15, 0.05, 0.03, 0.001, 0.2], [0.05, 0.4, 0.25, 0.01, 0.02, 0.04, 0.1], [0.01, 0.02, 0.2, 0.05, 0.1, 0.03, 0.01], [0.02, 0.01, 0.1, 0.3, 0.15, 0.25, 0.03], [0.15, 0.1, 0.13, 0.11, 0.3, 0.01, 0.02], [0.05, 0.04, 0.07, 0.1, 0.09, 0.25, 0.04], [0.02, 0.03, 0.01, 0.2, 0.25, 0.15, 0.03]]);**
> **Y7:=matrix(7,1,[130,150,120,170,240,260,150]);**

$$A7 := \begin{bmatrix} 0.3 & 0.1 & 0.15 & 0.05 & 0.03 & 0.001 & 0.2 \\ 0.05 & 0.4 & 0.25 & 0.01 & 0.02 & 0.04 & 0.1 \\ 0.01 & 0.02 & 0.2 & 0.05 & 0.1 & 0.03 & 0.01 \\ 0.02 & 0.01 & 0.1 & 0.3 & 0.15 & 0.25 & 0.03 \\ 0.15 & 0.1 & 0.13 & 0.11 & 0.3 & 0.01 & 0.02 \\ 0.05 & 0.04 & 0.07 & 0.1 & 0.09 & 0.25 & 0.04 \\ 0.02 & 0.03 & 0.01 & 0.2 & 0.25 & 0.15 & 0.03 \end{bmatrix}$$

$$Y7 := \begin{bmatrix} 130 \\ 150 \\ 120 \\ 170 \\ 240 \\ 260 \\ 150 \end{bmatrix}$$

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```
> B7:=matadd(E7,-A7);
```

$$B7 := \begin{bmatrix} 0.7 & -0.1 & -0.15 & -0.05 & -0.03 & -0.001 & -0.2 \\ -0.05 & 0.6 & -0.25 & -0.01 & -0.02 & -0.04 & -0.1 \\ -0.01 & -0.02 & 0.8 & -0.05 & -0.1 & -0.03 & -0.01 \\ -0.02 & -0.01 & -0.1 & 0.7 & -0.15 & -0.25 & -0.03 \\ -0.15 & -0.1 & -0.13 & -0.11 & 0.7 & -0.01 & -0.02 \\ -0.05 & -0.04 & -0.07 & -0.1 & -0.09 & 0.75 & -0.04 \\ -0.02 & -0.03 & -0.01 & -0.2 & -0.25 & -0.15 & 0.97 \end{bmatrix}$$

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```
> linsolve(B7,Y7);
```

$$\begin{bmatrix} 629.9872905 \\ 643.8041606 \\ 353.5122073 \\ 761.8685125 \\ 783.7659027 \\ 686.6417737 \\ 656.4540587 \end{bmatrix}$$

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```
> X7:=matrix(7,1,[200, 250, 200, 270, 250, 210, 180]);
```

$$X7 := \begin{bmatrix} 200 \\ 250 \\ 200 \\ 270 \\ 250 \\ 210 \\ 180 \end{bmatrix} \qquad \textbf{(19)}$$

```
> multiply(B7,X7);
```

$$\begin{bmatrix} 27.790 \\ 55.90 \\ 106.40 \\ 67.10 \\ 58.60 \\ 66.80 \\ 13.10 \end{bmatrix} \qquad \textbf{(20)}$$

```
> #
```
```
> .:
```
```
>
```