Cvičení: Vypočtěte determinanty daných matic

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

a)

```
> Ma:=matrix([[2,-1],[-4,3]]);
```

$$Ma := \begin{bmatrix} 2 & -1 \\ -4 & 3 \end{bmatrix}$$

```
> det(Ma);
```

$$2$$

b)

```
> Mb:=matrix([[0,1,-2],[-1,0,3],[2,-3,0]]);
```

$$Mb := \begin{bmatrix} 0 & 1 & -2 \\ -1 & 0 & 3 \\ 2 & -3 & 0 \end{bmatrix}$$

```
> det(Mb);
```

$$0$$

```
> gausselim(Mb);
```

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

c)

```
> Mc:=matrix([[1,2,3],[2,5,8],[3,8,10]]);
```

$$Mc := \begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 8 \\ 3 & 8 & 10 \end{bmatrix}$$

```
> det(Mc);
```

$$-3$$

d)

```
> Md:=matrix([[0,1,-1],[-2,1,3],[2,7,-8]]);
```

$$Md := \begin{bmatrix} 0 & 1 & -1 \\ -2 & 1 & 3 \\ 2 & 7 & -8 \end{bmatrix}$$

```
> det(Md);
```

$$6$$

e)

```
> Me:=matrix([[5,-1,0,2],[0,3,-1,5],[0,0,-4,2],[0,0,0,3]]);
```

$$Me := \begin{bmatrix} 5 & -1 & 0 & 2 \\ 0 & 3 & -1 & 5 \\ 0 & 0 & -4 & 2 \\ 0 & 0 & 0 & 3 \end{bmatrix}$$

```
> det(Me);
```

$$-180$$

f)

```
> Mf:=matrix([[1,-2,1,4],[2,-4,0,0],[3,-4,2,5],[0,2,-4,-9]]);
```

$$Mf := \begin{bmatrix} 1 & -2 & 1 & 4 \\ 2 & -4 & 0 & 0 \\ 3 & -4 & 2 & 5 \\ 0 & 2 & -4 & -9 \end{bmatrix}$$

```
> det(Mf);
```

$$40$$

```
> gausselim(Mf);
```

$$\begin{bmatrix} 1 & -2 & 1 & 4 \\ 0 & 2 & -1 & -7 \\ 0 & 0 & -2 & -8 \\ 0 & 0 & 0 & 10 \end{bmatrix}$$

g)

```
> Mg:=matrix([[2,1,-1],[0,4,3],[3,2,-2]]);
```

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

```
> det(Mg);
```

$$-7$$

h)

```
> Mh:=matrix([[-1,2,1],[1,3,2],[-4,1,2]]);
```

$$Mh := \begin{bmatrix} -1 & 2 & 1 \\ 1 & 3 & 2 \\ -4 & 1 & 2 \end{bmatrix}$$

```
> det(Mh);
```

$$-11$$

i)

```
> Mi:=matrix([[2,4,-3],[-2,1,0],[5,-2,4]]);
```

$$Mi := \begin{bmatrix} 2 & 4 & -3 \\ -2 & 1 & 0 \\ 5 & -2 & 4 \end{bmatrix}$$

```
> det(Mi);
```

$$43$$

j)

```
> Mj:=matrix([[4,0,0],[-2,cos(x),-sin(x)],[5,sin(x),cos(x)]]);
```

$$Mj := \begin{bmatrix} 4 & 0 & 0 \\ -2 & \cos(x) & -\sin(x) \\ 5 & \sin(x) & \cos(x) \end{bmatrix}$$

```
> det(Mj);
```

$$4\cos(x)^2 + 4\sin(x)^2$$

```
>
```