

Zadanie 1

```
a = [1 0 0];  
b = [0 5 0];  
c = [0 0 3];
```

a + b

```
ans = 1×3  
      1      5      0
```

a + c

```
ans = 1×3  
      1      0      3
```

b + c

```
ans = 1×3  
      0      5      3
```

a - b

```
ans = 1×3  
      1     -5      0
```

a - c

```
ans = 1×3  
      1      0     -3
```

b - a

```
ans = 1×3  
     -1      5      0
```

b - c

```
ans = 1×3  
      0      5     -3
```

c - a

```
ans = 1×3  
     -1      0      3
```

c - b

```
ans = 1×3  
      0     -5      3
```

dot(a,b)

```
ans =  
      0
```

dot(b,a)

```
ans =  
      0
```

% Tak, iloczyn skalarny jest zawsze przemienny

cross(a,b)

```
ans = 1×3
      0      0      5
```

cross(b,a)

```
ans = 1×3
      0      0     -5
```

% Nie, iloczyn wektorowy nie jest przemienny

dot(cross(a,b),c)

```
ans =
    15
```

Zadanie 2

```
A = [1 1 1; 2 2 2; 3 3 3];
B = [1 0 0; 0 2 0; 0 0 3];
```

A + B

```
ans = 3×3
      2      1      1
      2      4      2
      3      3      6
```

A - B

```
ans = 3×3
      0      1      1
      2      0      2
      3      3      0
```

B - A

```
ans = 3×3
      0     -1     -1
     -2      0     -2
     -3     -3      0
```

A * B

```
ans = 3×3
      1      2      3
      2      4      6
      3      6      9
```

B * A

```
ans = 3×3
      1      1      1
      4      4      4
      9      9      9
```

```
% Nie, mnożenie macierzy nie jest przemienne
```

```
det(A)
```

```
ans =  
0
```

```
det(B)
```

```
ans =  
6
```

```
%inv(A)  
inv(B)
```

```
ans = 3×3  
    1.0000    0    0  
    0    0.5000    0  
    0    0    0.3333
```

```
% Macierz kwadratowa A jest odwracalna jeżeli det(A) != 0
```

```
% Sprawdzenie  
B * inv(B)
```

```
ans = 3×3  
    1    0    0  
    0    1    0  
    0    0    1
```

Zadanie 3

```
C = [a; b; c]
```

```
C = 3×3  
    1    0    0  
    0    5    0  
    0    0    3
```

```
D = [a' b' c']
```

```
D = 3×3  
    1    0    0  
    0    5    0  
    0    0    3
```

```
det(C)
```

```
ans =  
15
```

```
det(D)
```

```
ans =  
15
```

Zadanie 4

```
a1 = [1 2 3 4];  
a2 = [1 1 1 1];  
  
A1 = eye(2);  
A2 = [1 2; 0 3];
```

```
M = [[a1; a2]; [A1 A2]]
```

```
M = 4x4  
     1     2     3     4  
     1     1     1     1  
     1     0     1     2  
     0     1     0     3
```

```
det(M)
```

```
ans =  
-8
```

```
inv(M)
```

```
ans = 4x4  
    -0.5000    1.0000    0.5000         0  
         0    0.7500   -0.7500    0.2500  
    0.5000   -0.5000         0   -0.5000  
         0   -0.2500    0.2500    0.2500
```

```
M(:,1)
```

```
ans = 4x1  
     1  
     1  
     1  
     0
```

```
M(3,:)
```

```
ans = 1x4  
     1     0     1     2
```

```
M(4,2)
```

```
ans =  
1
```

```
M(4,3)
```

```
ans =  
0
```

```
M(2:3,2:4)
```

```
ans = 2x3  
     1     1     1  
     0     1     2
```