

```
% gda00_07
% example of vector and matrix algebra
% supports Section I.4

% define matrices and vectors
a=[1, 3, 5]';
b=[2, 4, 6]';
M=[ [1, 0, 2]', [0, 1, 0]', [2, 0, 1]'];
N=[ [1, 0, -1]', [0, 2, 0]', [-1, 0, 3]'];
I = eye(3);
I
```

```
I =

     1     0     0
     0     1     0
     0     0     1
```

```
% addition and subtraction
S = M+N;
S
```

```
S =

     2     0     1
     0     3     0
     1     0     4
```

```
D = M-N;
D
```

```
D =

     0     0     3
     0    -1     0
     3     0    -2
```

```
% dot product
s = a'*b;
s
```

```
s = 44
```

```
% outer product
T = a*b';
T
```

```
T =

     2     4     6
     6    12    18
    10    20    30
```

```
% matrix times vector
c = M*a;
```

C

C =

11  
3  
7

```
% matrix times matrix
```

```
P = M*N;
```

```
P
```

P =

-1      0      5  
0      2      0  
1      0      1

```
% element-wise multiplication of two vectors
```

```
d = a.*b;
```

```
d
```

d =

2  
12  
30