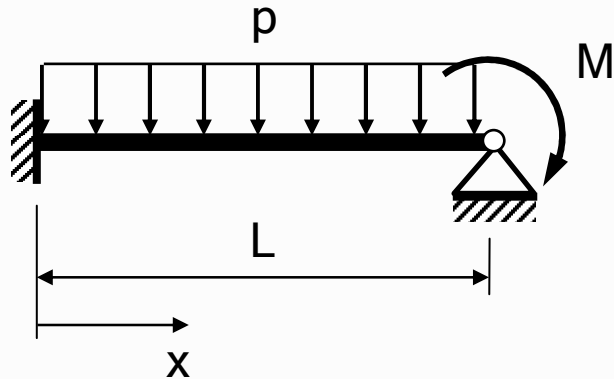


3-1. naloga: izvozi podatke v *MS-Excel* in jih ponovno preberi v *Matlab*

3-1. naloga: izvozi podatke v *MS-Excel* in jih ponovno preberi v *Matlab*

- izvozi v *Matlab*-u izračunane podatke v *MS-Excel*
- v *MS-Excel*-u spremenite enoto za koordinato x iz [mm] v [m]
- uvozite nove podatke v *Matlab*

3-1. naloga: izvozi podatke v *MS-Excel*/in jih ponovno preberi v *Matlab*



$$p = 4 \text{ N/mm}$$

$$L = 4000 \text{ mm}$$

$$M = 9 \text{ kNm}$$

$$E = 2 \cdot 10^5 \text{ MPa}$$

$$J = 171 \cdot 10^4 \text{ mm}^4$$

$$C_1 = \frac{M}{4 E J L} - \frac{3 C_2 L}{2}$$

$$C_2 = \frac{p}{24 E J}$$

$$w(x) = x^2 (x - L) (C_1 + C_2 x)$$

### 3-1. naloga: izvozi podatke v *MS-Excel* in jih ponovno preberi v *Matlab*

The screenshot displays the MATLAB software interface. The main window is titled "Editor - C:\2010\_11-NM-RR-redni-vaje\3\_vaja\Waja\_3\_2.m". The script contains the following code:

```
1 % povezava z MS-Excel-om
2 - clc;
3 - clear all;
4 - L=4e3; % [mm]
5 - M=9e6; % [Nmm]
6 - p=4; % [N/mm]
7 - E=2e5; % [MPa]
8 - J=171e4; % [mm4]
9 - C2=p/(24*E*J);
10 - C1=M/(4*E*J*L)-3*C2*L/2;
11 %
12 - x=0:500:L;
13 - w=(x.^2).*(x-L).*(C1+C2.*x);
14 %
15 - M=[x',w'];
16 - izvoz=xlswrite('test.xls',M)
17 %
18 - fprintf('Uredi podatke v MS-Excelu \nPritisni tipko ENTER\n');
19 - pause
20 %
```

The Command Window on the right shows the execution output:

```
izvoz =
     1
Uredi podatke v MS-Excelu
Pritisni tipko ENTER
```

The status bar at the bottom indicates the script is paused, with the message "Paused: Press any key". The current position is "Ln 20 Col 2".

3-1. naloga: izvozi podatke v *MS-Excel* in jih ponovno preberi v *Matlab*

Microsoft Excel - test.xls

Datoteka Urejanje Pogled Vstavljanje Oblika Orodja Podatki Okno Pomoč OmniPage

Σ Arial 10 K L P

B16 fx

	A	B	C	D	E	F	G	H	I
1	0	0							
2	500	0,906128							
3	1000	2,375731							
4	1500	3,083882							
5	2000	2,436647							
6	2500	0,571089							
7	3000	-1,64474							
8	3500	-2,61178							
9	4000	0							
10									
11									

List1 / List2 / List3

Pripravljen

3-1. naloga: izvozi podatke v *MS-Excel* in jih ponovno preberi v *Matlab*

Microsoft Excel - test.xls

Datoteka Urejanje Pogled Vstavljanje Oblika Orodja Podatki Okno Pomoč OmniPage

Σ Arial 10 K L P

B15 fx

	A	B	C	D	E	F	G	H	I
1	0	0,0	0						
2	500	0,5	0,906128						
3	1000	1,0	2,375731						
4	1500	1,5	3,083882						
5	2000	2,0	2,436647						
6	2500	2,5	0,571089						
7	3000	3,0	-1,64474						
8	3500	3,5	-2,61178						
9	4000	4,0	0						
10									
11									

List1 / List2 / List3

Pripravljen

### 3-1. naloga: izvozi podatke v *MS-Excel* in jih ponovno preberi v *Matlab*

The screenshot displays the MATLAB environment with the following components:

- Current Directory - ...ja**: Shows a file list including '2010\_10\_...', 'Vaja\_4\_1...', 'Vaja\_4\_2...', 'Vaja\_4\_3...', and 'test.xls'.
- Editor - C:\2010\_11-NM-RR-redni-vaje\4\_vaja\Vaja\_4\_1\_Excel.m**: Contains the following MATLAB code:

```
1 % povezava z MS-Excel-om
2 - clc;
3 - clear all;
4 - L=4e3; % [mm]
5 - M=9e6; % [Nmm]
6 - p=4; % [N/mm]
7 - E=2e5; % [MPa]
8 - J=171e4; % [mm4]
9 - C2=p/(24*E*J);
10 - C1=M/(4*E*J*L)-3*C2*L/2;
11 %
12 - x=0:500:L;
13 - w=(x.^2).*(x-L).*(C1+C2.*x);
14 %
15 - M=[x',w'];
16 - izvoz=xlswrite('test.xls',M)
17 %
18 - uvoz=xlsread('test.xls',-1);
19 - uvoz
```
- Command Window**: Shows the execution results:

```
izvoz =
      1
      0      0
0.5000  0.9061
1.0000  2.3757
1.5000  3.0839
2.0000  2.4366
2.5000  0.5711
3.0000 -1.6447
3.5000 -2.6118
4.0000      0
>>
```

3-1. naloga: izvozi podatke v *MS-Excel* in jih ponovno preberi v *Matlab*

Microsoft Excel - test.xls [Samo za branje]

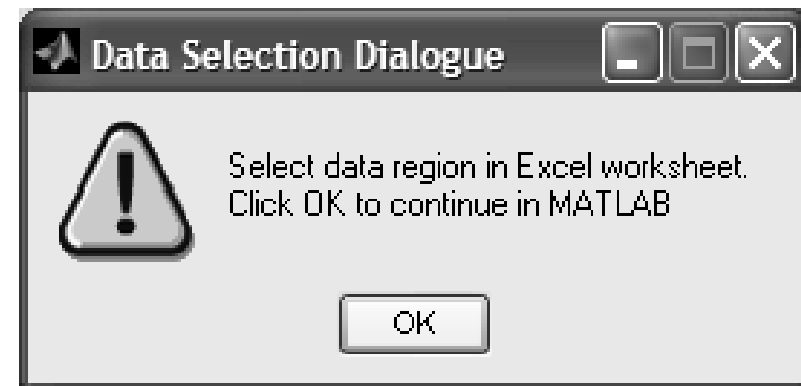
Datoteka Urejanje Pogled Vstavljanje Oblika Orodja  
Podatki Okno Pomoč OmniPage

Σ 10 K P

B1 =A1/1000

	A	B	C	D	E
1	0	0,0	0		
2	500	0,5	0,906128		
3	1000	1,0	2,375731		
4	1500	1,5	3,083882		
5	2000	2,0	2,436647		
6	2500	2,5	0,571089		
7	3000	3,0	-1,64474		
8	3500	3,5	-2,61178		
9	4000	4,0	0		
10					
11					

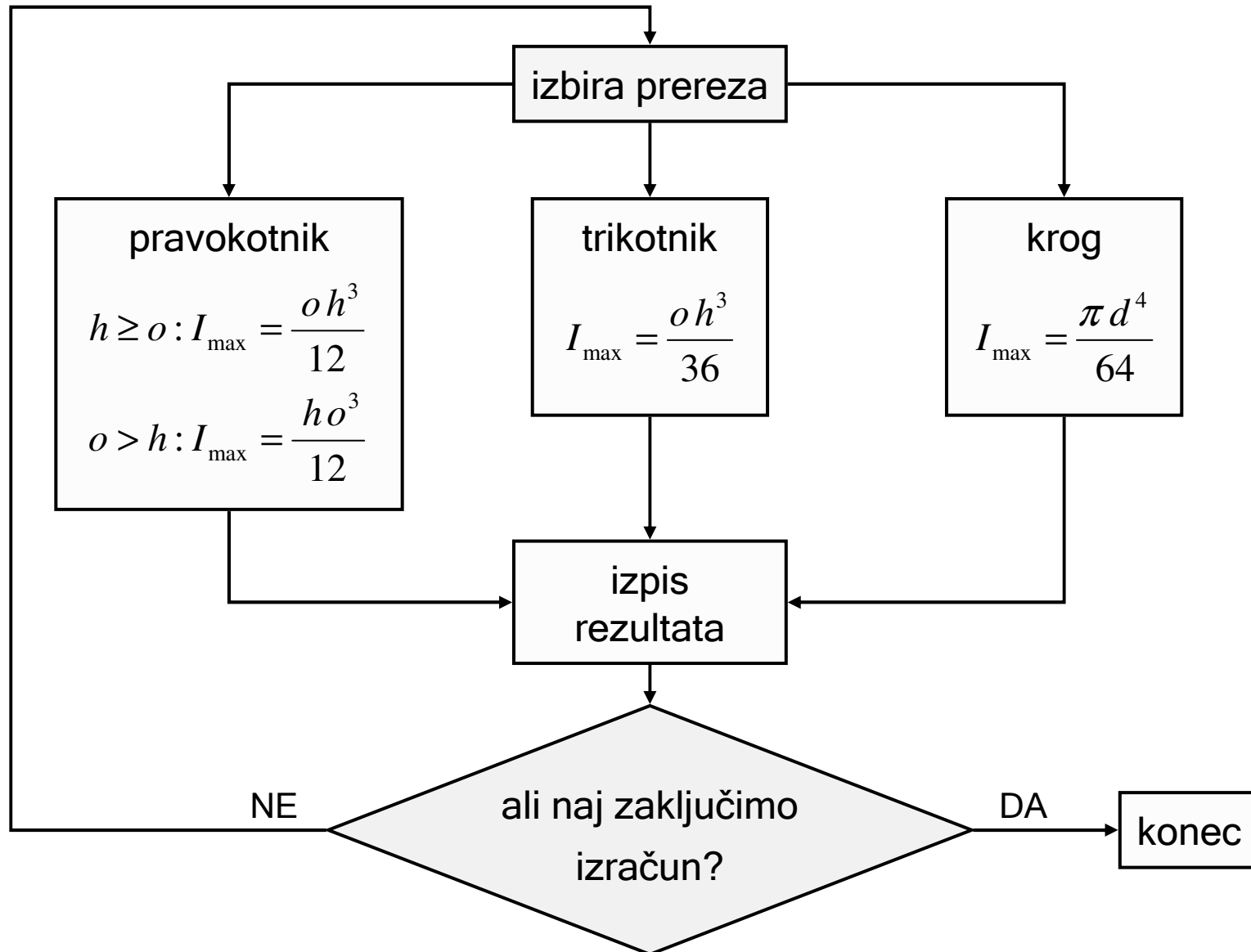
Prilavlj Vsota=23,1



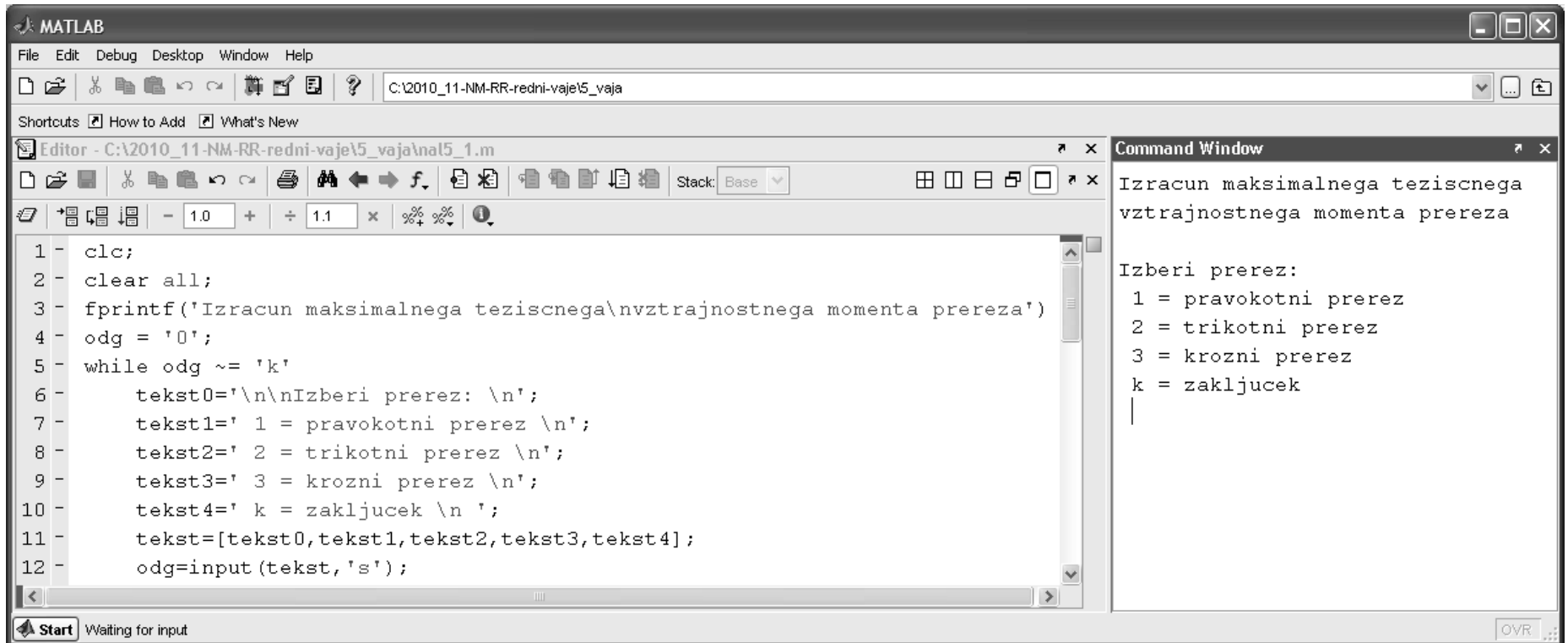


**3-2. naloga: izračun maksimalnega težiščnega  
vztrajnostnega momenta prereza**

3-2. naloga: izračun maksimalnega težiščnega vztrajnostnega momenta prereza



## 3-2. naloga: izračun maksimalnega težiščnega vztrajnostnega momenta prereza



The image shows a MATLAB environment with an Editor window and a Command Window. The Editor window contains a script named 'nal5\_1.m' with the following code:

```
1 - clc;
2 - clear all;
3 - fprintf('Izracun maksimalnega teziscnega\nvztrajnostnega momenta prereza')
4 - odg = '0';
5 - while odg ~= 'k'
6 -     tekst0='\n\nIzberi prerez: \n';
7 -     tekst1=' 1 = pravokotni prerez \n';
8 -     tekst2=' 2 = trikotni prerez \n';
9 -     tekst3=' 3 = krozni prerez \n';
10 -    tekst4=' k = zakljucek \n ';
11 -    tekst=[tekst0,tekst1,tekst2,tekst3,tekst4];
12 -    odg=input(tekst, 's');
```

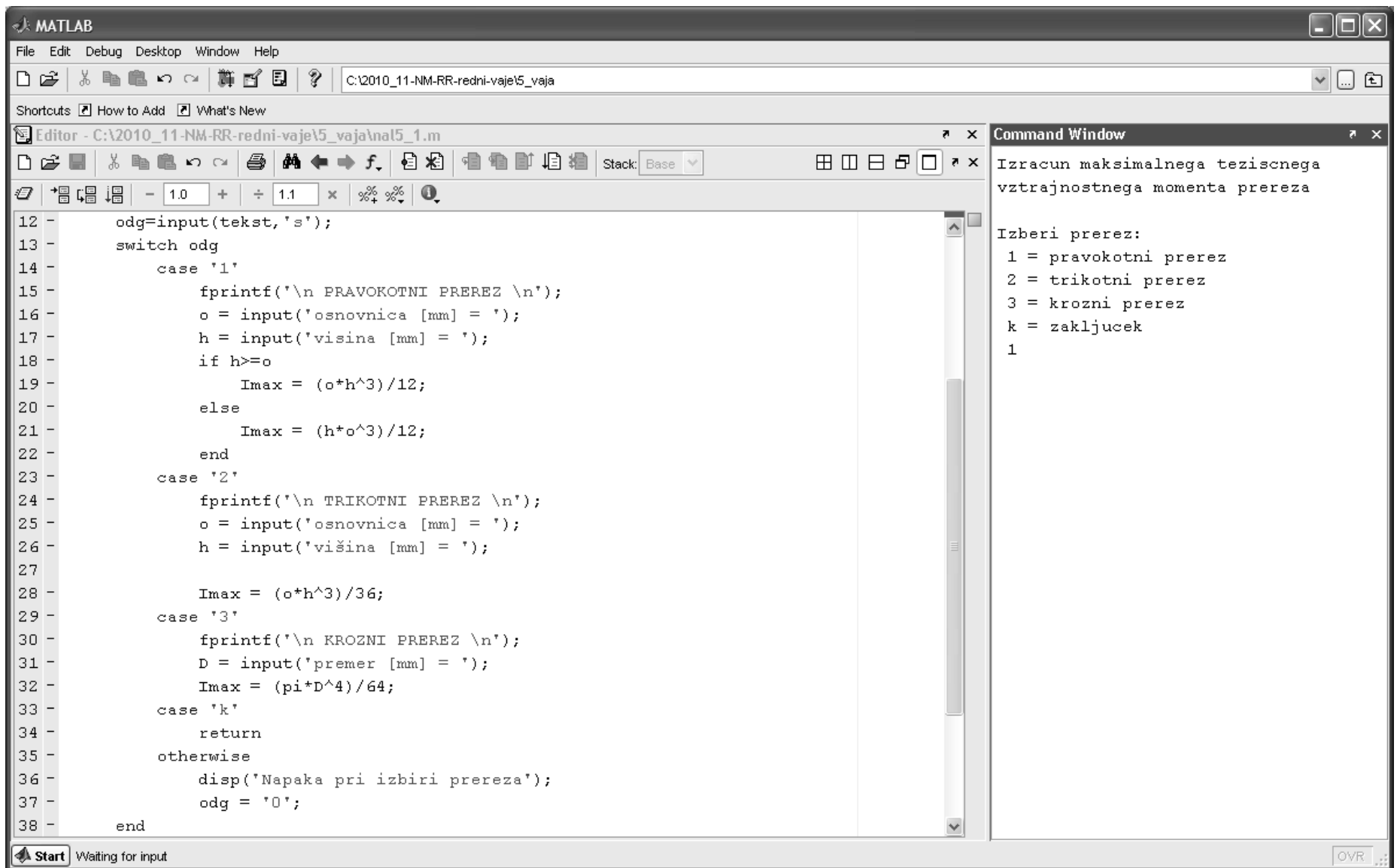
The Command Window displays the output of the script:

```
Izracun maksimalnega teziscnega
vztrajnostnega momenta prereza

Izberi prerez:
 1 = pravokotni prerez
 2 = trikotni prerez
 3 = krozni prerez
 k = zakljucek
|
```

The MATLAB status bar at the bottom indicates 'Start' and 'Waiting for input'.

## 3-2. naloga: izračun maksimalnega težiščnega vztrajnostnega momenta prereza



The image shows a MATLAB environment with an Editor window and a Command Window. The Editor window contains a script for calculating the maximum centroidal moment of inertia ( $I_{max}$ ) for different cross-sections based on user input.

```
12 -   odg=input('tekst, 's');
13 -   switch odg
14 -       case '1'
15 -           fprintf('\n PRAVOKOTNI PREREZ \n');
16 -           o = input('osnovnica [mm] = ');
17 -           h = input('visina [mm] = ');
18 -           if h>=o
19 -               Imax = (o*h^3)/12;
20 -           else
21 -               Imax = (h*o^3)/12;
22 -           end
23 -       case '2'
24 -           fprintf('\n TRIKOTNI PREREZ \n');
25 -           o = input('osnovnica [mm] = ');
26 -           h = input('višina [mm] = ');
27 -
28 -           Imax = (o*h^3)/36;
29 -       case '3'
30 -           fprintf('\n KROZNI PREREZ \n');
31 -           D = input('premer [mm] = ');
32 -           Imax = (pi*D^4)/64;
33 -       case 'k'
34 -           return
35 -       otherwise
36 -           disp('Napaka pri izbiri prereza');
37 -           odg = '0';
38 -   end
```

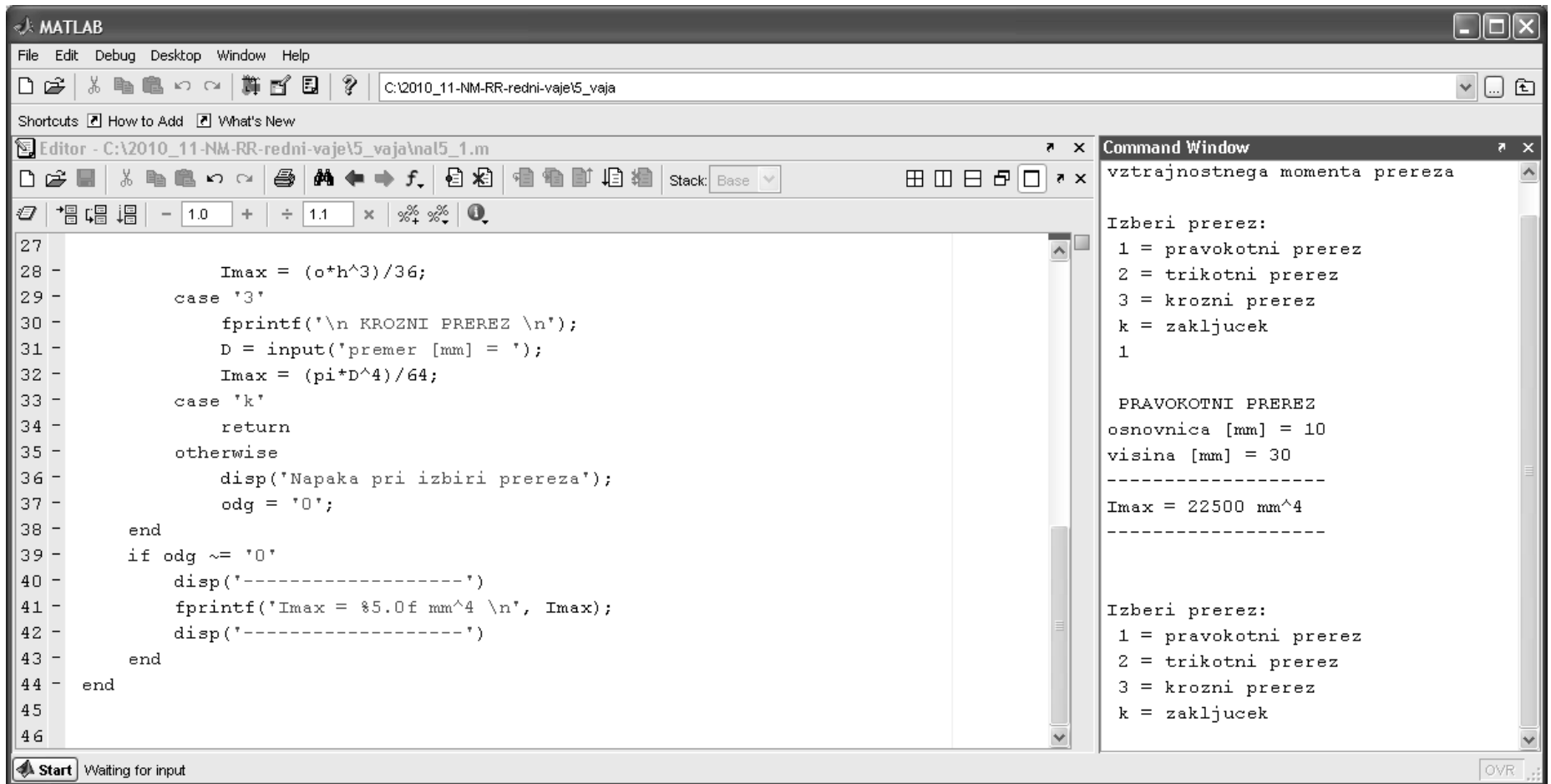
The Command Window displays the following text:

```
Izracun maksimalnega teziscnega
vztrajnostnega momenta prereza

Izberi prerez:
1 = pravokotni prerez
2 = trikotni prerez
3 = krozni prerez
k = zakljucek
1
```

The MATLAB status bar at the bottom indicates "Start" and "Waiting for input".

## 3-2. naloga: izračun maksimalnega težiščnega vztrajnostnega momenta prereza



The image shows a MATLAB environment with an Editor window and a Command Window. The Editor window contains a script for calculating the maximum centroidal moment of inertia ( $I_{max}$ ) for a cross-section. The script uses a `switch` statement to handle different cross-section types: '3' for a rectangular cross-section and 'k' for a circular cross-section. For the rectangular cross-section, it calculates  $I_{max} = (o \cdot h^3) / 36$  and prompts the user for the width  $D$  in mm. For the circular cross-section, it calculates  $I_{max} = (\pi \cdot D^4) / 64$ . The script also includes error handling and displays the result in mm<sup>4</sup>.

```
27 -         Imax = (o*h^3)/36;
28 -     case '3'
29 -         fprintf('\n KROZNI PREREZ \n');
30 -         D = input('premer [mm] = ');
31 -         Imax = (pi*D^4)/64;
32 -     case 'k'
33 -         return
34 -     otherwise
35 -         disp('Napaka pri izbiri prereza');
36 -         odg = '0';
37 -     end
38 -     if odg ~= '0'
39 -         disp('-----')
40 -         fprintf('Imax = %5.0f mm^4 \n', Imax);
41 -         disp('-----')
42 -     end
43 - end
44 - end
45
46
```

The Command Window shows the execution of the script. It prompts the user to select a cross-section type (1 for rectangular, 2 for triangular, 3 for circular, k for circle). The user selects '1' (rectangular). The program displays the dimensions: basic side [mm] = 10 and height [mm] = 30. The calculated maximum moment of inertia is  $I_{max} = 22500 \text{ mm}^4$ .

```
vztrajnostnega momenta prereza

Izberi prerez:
1 = pravokotni prerez
2 = trikotni prerez
3 = krozni prerez
k = zaključek
1

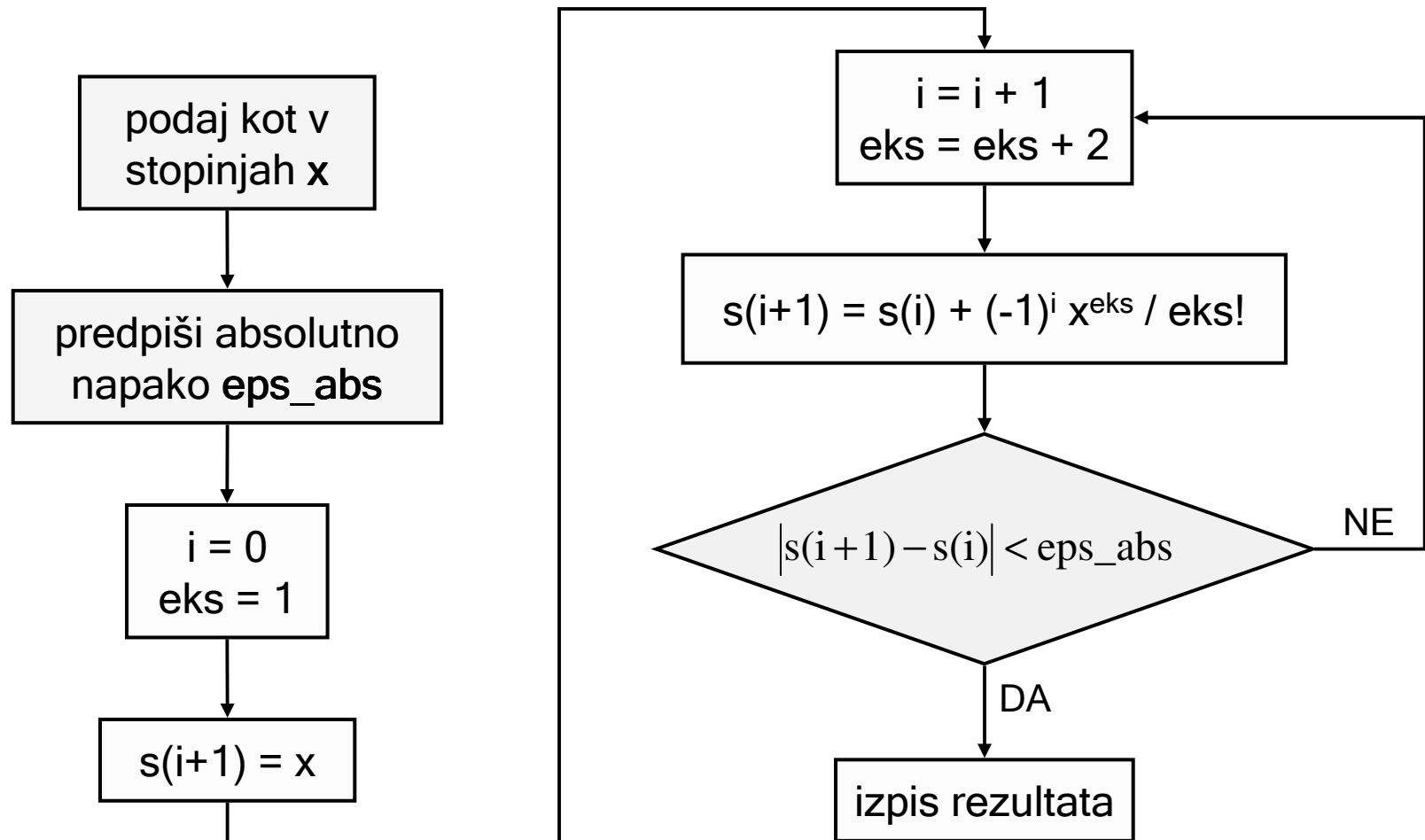
PRAVOKOTNI PREREZ
osnovnica [mm] = 10
visina [mm] = 30
-----
Imax = 22500 mm^4
-----

Izberi prerez:
1 = pravokotni prerez
2 = trikotni prerez
3 = krozni prerez
k = zaključek
```

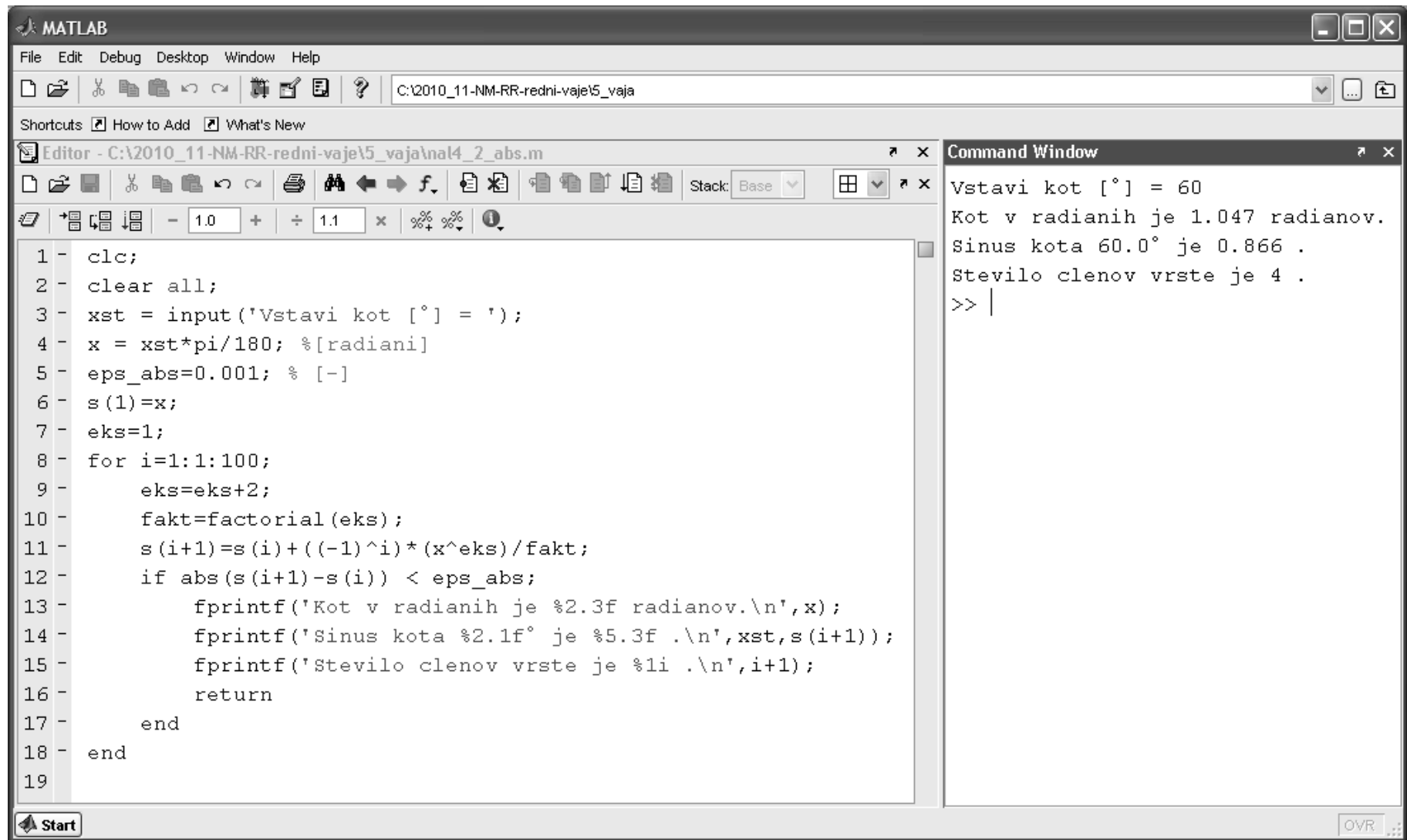
3-3. naloga: izračun vrednosti  $y=\sin(x)$  s potenčno vrsto s predpisano absolutno ali relativno napako izračuna

$$y = \sin(x) \approx \frac{x^1}{1!} - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

3-3. naloga: izračun vrednosti  $y=\sin(x)$  s potenčno vrsto s predpisano absolutno napako izračuna



### 3-3. naloga: izračun vrednosti $y=\sin(x)$ s potenčno vrsto s predpisano absolutno napako izračuna



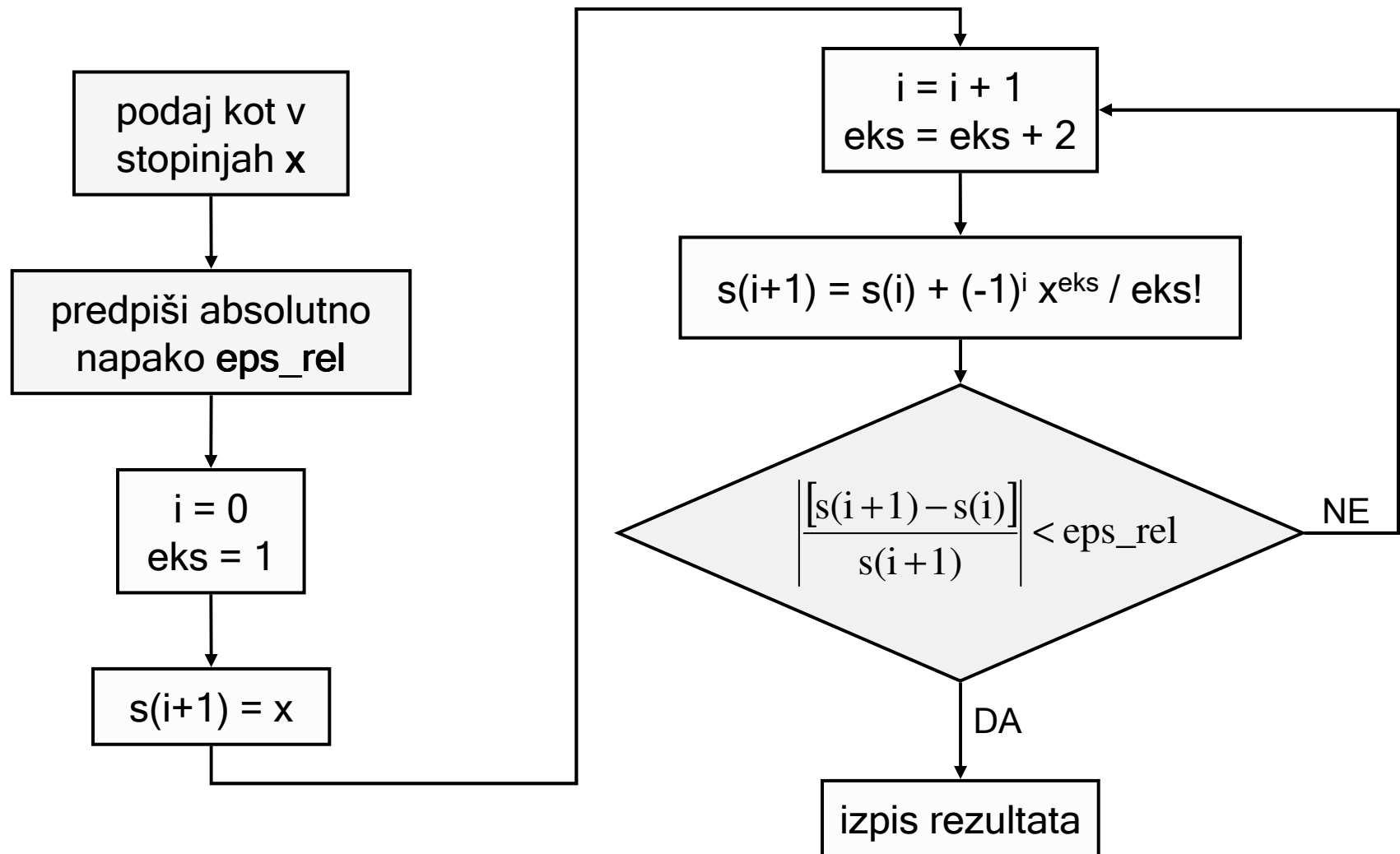
The image shows a MATLAB environment with an Editor window and a Command Window. The Editor window contains a script named 'nal4\_2\_abs.m' that implements a Taylor series approximation of the sine function. The script prompts the user to input an angle in degrees, converts it to radians, and iteratively adds terms of the series until the absolute error is less than a specified tolerance (0.001). The Command Window shows the execution of the script, displaying the input angle (60 degrees), the angle in radians (1.047), the sine value (0.866), and the number of terms used (4).

```
1 - clc;
2 - clear all;
3 - xst = input('Vstavi kot [°] = ');
4 - x = xst*pi/180; %[radiani]
5 - eps_abs=0.001; % [-]
6 - s(1)=x;
7 - eks=1;
8 - for i=1:1:100;
9 -     eks=eks+2;
10 -    fakt=factorial(eks);
11 -    s(i+1)=s(i)+((-1)^i)*(x^eks)/fakt;
12 -    if abs(s(i+1)-s(i)) < eps_abs;
13 -        fprintf('Kot v radianih je %2.3f radianov.\n',x);
14 -        fprintf('Sinus kota %2.1f° je %5.3f .\n',xst,s(i+1));
15 -        fprintf('Stevilo členov vrste je %li .\n',i+1);
16 -        return
17 -    end
18 - end
19
```

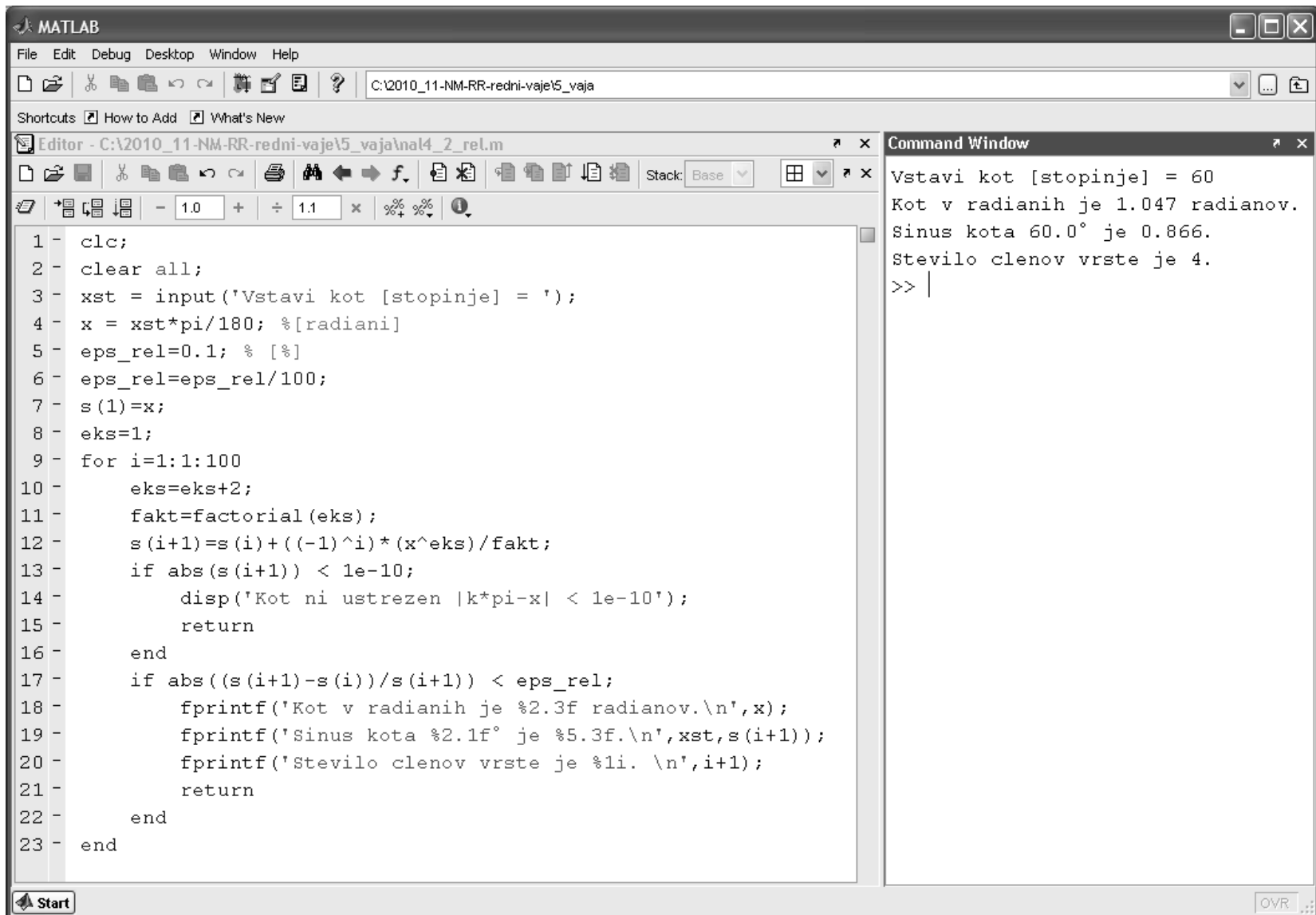
```
Vstavi kot [°] = 60
Kot v radianih je 1.047 radianov.
Sinus kota 60.0° je 0.866 .
Stevilo členov vrste je 4 .
>> |
```



3-3. naloga: izračun vrednosti  $y=\sin(x)$  s potenčno vrsto s predpisano relativno napako izračuna



### 3-3. naloga: izračun vrednosti $y=\sin(x)$ s potenčno vrsto s predpisano relativno napako izračuna



The screenshot shows the MATLAB environment with two windows: the Editor and the Command Window.

**Editor - C:\2010\_11-NM-RR-redni-vaje\5\_vaja\nal4\_2\_rel.m**

```
1 - clc;
2 - clear all;
3 - xst = input('Vstavi kot [stopinje] = ');
4 - x = xst*pi/180; %[radiani]
5 - eps_rel=0.1; % [%]
6 - eps_rel=eps_rel/100;
7 - s(1)=x;
8 - eks=1;
9 - for i=1:1:100
10 -     eks=eks+2;
11 -     fakt=factorial(eks);
12 -     s(i+1)=s(i)+((-1)^i)*(x^eks)/fakt;
13 -     if abs(s(i+1)) < 1e-10;
14 -         disp('Kot ni ustrezen |k*pi-x| < 1e-10');
15 -         return
16 -     end
17 -     if abs((s(i+1)-s(i))/s(i+1)) < eps_rel;
18 -         fprintf('Kot v radianih je %2.3f radianov.\n',x);
19 -         fprintf('Sinus kota %2.1f° je %5.3f.\n',xst,s(i+1));
20 -         fprintf('Stevilo členov vrste je %li. \n',i+1);
21 -         return
22 -     end
23 - end
```

**Command Window**

```
Vstavi kot [stopinje] = 60
Kot v radianih je 1.047 radianov.
Sinus kota 60.0° je 0.866.
Stevilo členov vrste je 4.
>> |
```