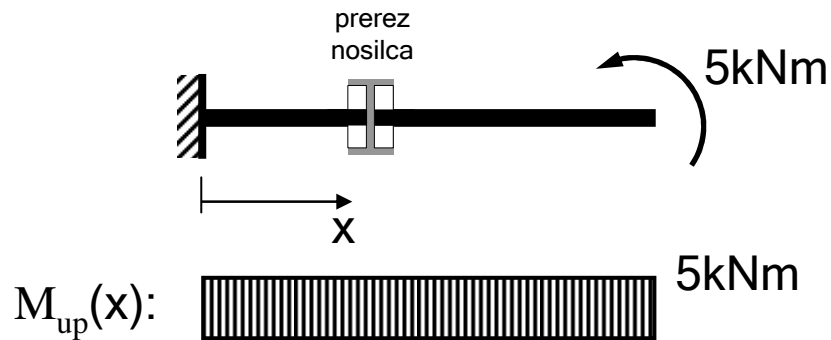
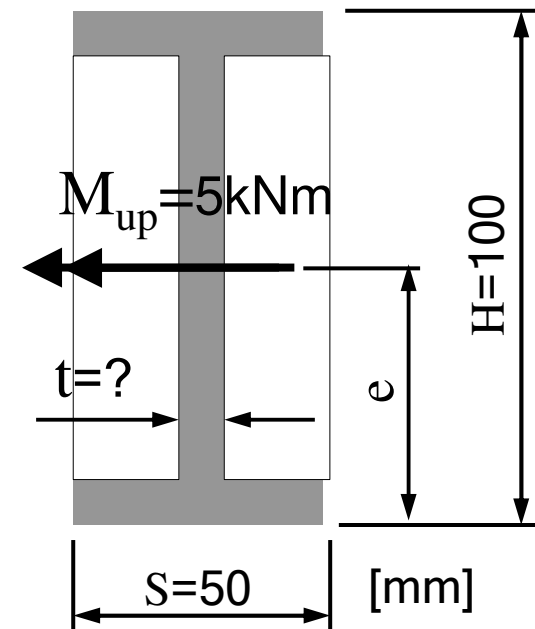


9-1. naloga: določite debelino stene t podanega I-profila



$$\sigma_{xx}^{\max} = \frac{M_{up} e}{I(t)} \leq \sigma_{dop}$$

$$I(t) = \frac{SH^3}{12} - \frac{(S-t)(H-2t)^3}{12}, \quad e = \frac{H}{2}$$



$$\sigma_{dop} = 100\text{MPa}$$

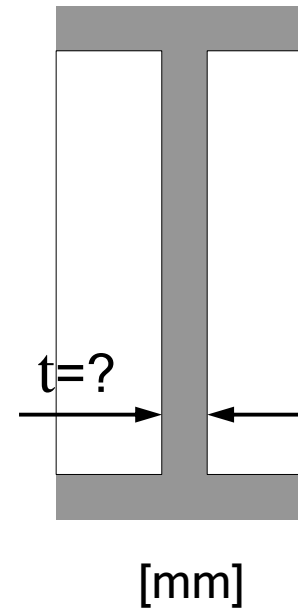
$$f(t) = M_{up} e - \sigma_{dop} I(t) = 0, \quad t_{\min} = ?$$

9-1. naloga: določite debelino stene t podanega I-profila

$$f(t) = 375 \cdot 10^4 - 5 \cdot 10^5 \cdot t + 15 \cdot 10^3 \cdot t^2 - 200 \cdot t^3 + t^4 = 0$$
$$t_{\min} = ?$$

Za določitev vrednosti t uporabite:

- grafično metodo
- Newton-ovo metodo
- sekantno metodo
- bisekcijsko metodo
- funkcijo *fzero*



9-1. naloga: določite debelino stene t podanega I-profila

The image shows the MATLAB environment with a script in the Editor and a plot in the Figures window.

Workspace:

Name	Value
dfun	$\theta(t) -5e5+3$
fun	$\theta(t) 375e4-$
i	6
n	100
raz	0
t0	10.2365
t1	10.2365

Editor - C:\2010_11-NM-RR-redni-vaje\12_vaja\nal12_1.m*

```
1 %   
2 % graficna metoda  
3 - clc;  
4 - clear all;  
5 - fun=@(t) 375e4-5e5*t+15e3*t.^2-200*t.^3+t.^4;  
6 - while 1  
7 -     tz=input('leva vrednost = ');  
8 -     tk=input('desna vrednost = ');  
9 -     disp('#####')  
10 -    t=linspace(tz,tk,11);  
11 -    f=fun(t);  
12 -    plot(t,f);  
13 -    xlabel('t [mm]');  
14 -    grid on  
15 - end
```

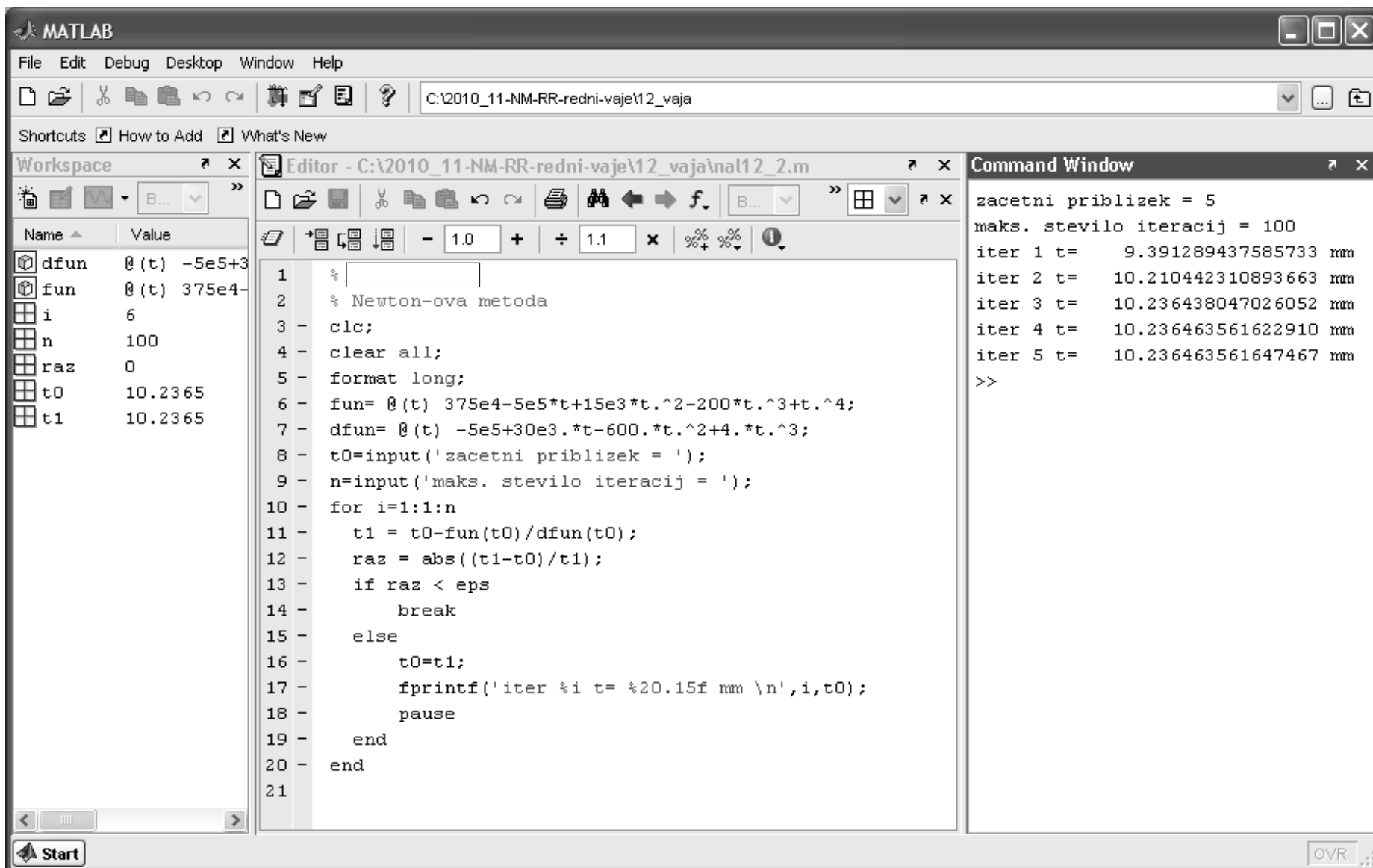
Command Window

```
leva vrednost = 5  
desna vrednost = 15  
#####  
leva vrednost =
```

Figures - Figure 1

t [mm]	f(t) [x 10 ⁶]
5	1.6
6	1.0
7	0.4
8	-0.2
9	-0.8
10	-1.4
11	-2.0
12	-2.6
13	-3.2
14	-3.8
15	-4.4

9-1. naloga: določite debelino stene t podanega I-profila



The image shows the MATLAB environment with the following components:

- Workspace:** A table listing variables and their values:

Name	Value
dfun	@(t) -5e5+3
fun	@(t) 375e4-
i	6
n	100
raz	0
t0	10.2365
t1	10.2365
- Editor:** A script file named `nal12_2.m` containing the following code:

```
1 %   
2 % Newton-ova metoda  
3 - clc;  
4 - clear all;  
5 - format long;  
6 - fun= @(t) 375e4-5e5*t+15e3*t.^2-200*t.^3+t.^4;  
7 - dfun= @(t) -5e5+30e3.*t-600.*t.^2+4.*t.^3;  
8 - t0=input('zacetni priblizek = ');  
9 - n=input('maks. stevilo iteracij = ');  
10 - for i=1:1:n  
11 -     t1 = t0-fun(t0)/dfun(t0);  
12 -     raz = abs((t1-t0)/t1);  
13 -     if raz < eps  
14 -         break  
15 -     else  
16 -         t0=t1;  
17 -         fprintf('iter %i t= %20.15f mm \n',i,t0);  
18 -         pause  
19 -     end  
20 - end  
21
```
- Command Window:** The output of the script, showing the initial guess and the results of five iterations:

```
zacetni priblizek = 5  
maks. stevilo iteracij = 100  
iter 1 t= 9.391289437585733 mm  
iter 2 t= 10.210442310893663 mm  
iter 3 t= 10.236438047026052 mm  
iter 4 t= 10.236463561622910 mm  
iter 5 t= 10.236463561647467 mm  
>>
```

9-1. naloga: določite debelino stene t podanega I-profila

The image shows the MATLAB environment with the following components:

- Workspace:** A table listing variables and their values:

Name	Value
fun	@(t) 375e4-
i	8
n	100
raz	1.7353e-016
t0	10.2365
t1	10.2365
t2	10.2365
- Editor:** A script file named 'nal12_3.m' containing the following code:

```
1 %   
2 % sekantna metoda  
3 - clc;  
4 - clear all;  
5 - format long;  
6 - fun= @(t) 375e4-5e5*t+15e3*t.^2-200*t.^3+t.^4;  
7 - t0=input('prvi priblizek = ');  
8 - t1=input('drugi priblizek = ');  
9 - n=input('maks. stevilo iteracij = ');  
10 - for i=1:n  
11 -     t2 = t0-fun(t0)*(t1-t0)/(fun(t1)-fun(t0));  
12 -     raz = abs((t2-t1)/t2);  
13 -     if raz < eps  
14 -         break  
15 -     else  
16 -         t0=t1;  
17 -         t1=t2;  
18 -         fprintf('iter %i t= %20.15f mm \n',i,t1);  
19 -         pause  
20 -     end  
21 - end  
22
```
- Command Window:** Shows the execution output:

```
prvi priblizek = 5  
drugi priblizek = 6  
maks. stevilo iteracij = 100  
iter 1 t= 9.540406604846694 mm  
iter 2 t= 10.135886176840277 mm  
iter 3 t= 10.233866221076616 mm  
iter 4 t= 10.236453728406023 mm  
iter 5 t= 10.236463560684061 mm  
iter 6 t= 10.236463561647469 mm  
iter 7 t= 10.236463561647465 mm  
>>
```

9-1. naloga: določite debelino stene t podanega I-profila

The MATLAB interface displays a script in the Editor window and its execution output in the Command Window.

Workspace:

Name	Value
fun	@(t) 375e4-5e5*t+15e3*t.^2-200*t.^3+t.^4
i	27
n	100
t0	10.2365
tD	10.2365
tL	10.2365

Editor - C:\2010_11-NM-RR-redni-vaje\12_vaja\nal12_4.m

```
1 % 
2 % bisekcijska metoda
3 - clc;
4 - clear all;
5 - format long;
6 - fun= @(t) 375e4-5e5*t+15e3*t.^2-200*t.^3+t.^4;
7 - tL=input('levi priblizek = ');
8 - tD=input('desni priblizek = ');
9 - if fun(tL)*fun(tD) > 0
10 -     disp('tL in tD nimata ustrezne vrednosti');
11 -     return;
12 - end
13 - n=input('maks. stevilo iteracij = ');
14 - t0=(tL+tD)/2;
15 - for i=1:n
16 -     if (fun(t0)*fun(tL)) > 0
17 -         tL=t0;
18 -     else
19 -         if abs(fun(t0)*fun(tL)) < 1.e-6
20 -             break;
21 -         else
22 -             tD=t0;
23 -         end
24 -     end
25 -     t0=(tL+tD)/2;
26 -     fprintf('iter %2i t= %15.10f mm \n',i,t0);
27 -     pause
28 - end
29
```

Command Window

```
levi priblizek = 9
desni priblizek = 11
maks. stevilo iteracij = 100
iter 1 t= 10.5000000000 mm
iter 2 t= 10.2500000000 mm
iter 3 t= 10.1250000000 mm
iter 4 t= 10.1875000000 mm
iter 5 t= 10.2187500000 mm
iter 6 t= 10.2343750000 mm
iter 7 t= 10.2421875000 mm
iter 8 t= 10.2382812500 mm
iter 9 t= 10.2363281250 mm
iter 10 t= 10.2373046875 mm
iter 11 t= 10.2368164063 mm
iter 12 t= 10.2365722656 mm
iter 13 t= 10.2364501953 mm
iter 14 t= 10.2365112305 mm
iter 15 t= 10.2364807129 mm
iter 16 t= 10.2364654541 mm
iter 17 t= 10.2364578247 mm
iter 18 t= 10.2364616394 mm
iter 19 t= 10.2364635468 mm
iter 20 t= 10.2364645004 mm
iter 21 t= 10.2364640236 mm
iter 22 t= 10.2364637852 mm
iter 23 t= 10.2364636660 mm
iter 24 t= 10.2364636064 mm
iter 25 t= 10.2364635766 mm
iter 26 t= 10.2364635617 mm
>>
```

9-1. naloga: določite debelino stene t podanega I-profila

The image shows the MATLAB environment with the following components:

- Workspace:** Lists variables: fun (0(t) 375000), fv (4.2746e-010), x (10.2365), xD (15), and xL (5).
- Editor:** Contains the following MATLAB code:

```
1 % 
2 % Računanje približka korena enačbe z "fzero"
3 - clc;
4 - clear all;
5 - fun= @(t) 375e4-5e5*t+15e3*t.^2-200*t.^3+t.^4;
6 - xL=input('Podaj levi približek: ');
7 - xD=input('Podaj desni približek: ');
8 - %[x, fv]=fzero(fun,xL);
9 - [x, fv]=fzero(fun,[xL, xD]);
10 - if x==nan
11 -     error('Korena ne znam izracunati...');
12 - end
13 - fprintf('debelina=%15.6f mm \n',x);
14 - fprintf('funkcijska vrednost=%12.8f\n',fv);
```
- Command Window:** Shows the execution output:

```
Podaj levi približek: 5
Podaj desni približek: 15
debelina=      10.236464 mm
funkcijska vrednost=  0.00000000
>>
```