

תשובות לתרגול 1 בשימושי מחשב

גל א.). השימוש על אחריות המשתמש בלבד) gordo6 התשובות נכתבו על ידי המשתמש

שאלות מטלב

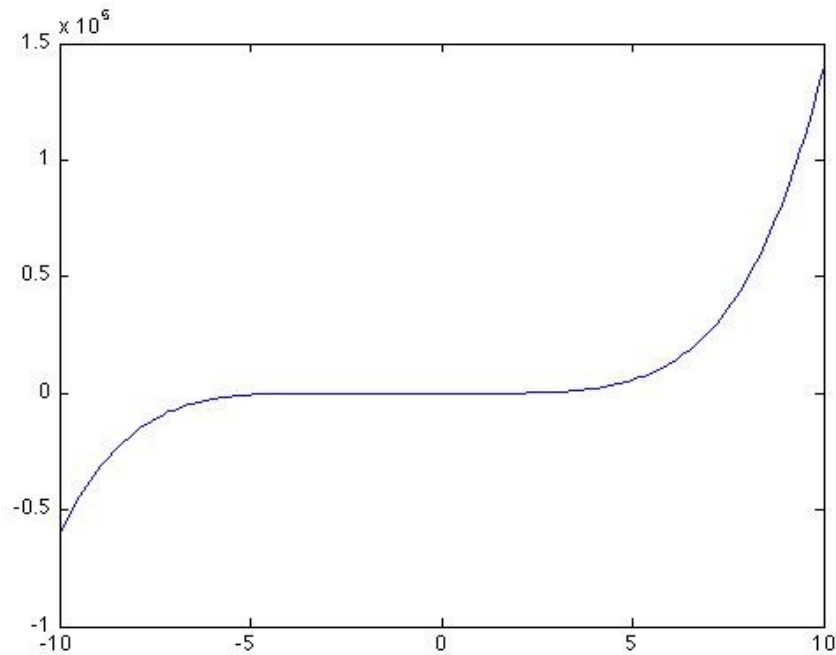
EDU>> **%question 1 - MatLab part**

EDU>> f=inline('x.^5+4*x.^4+x-2'); g=inline('4+x.*sin(x)'); h=inline('2*x.*log(abs(x))+8*cos(x)-6');

EDU>> x=-10:0.1:10;

EDU>> **%for f**

EDU>> plot(x,f(x))



EDU>> %we'll search for the roots based on the graph

EDU>> fzero(f,-4)

ans =

-3.9761

EDU>> fzero(f,-1)

ans =

-1

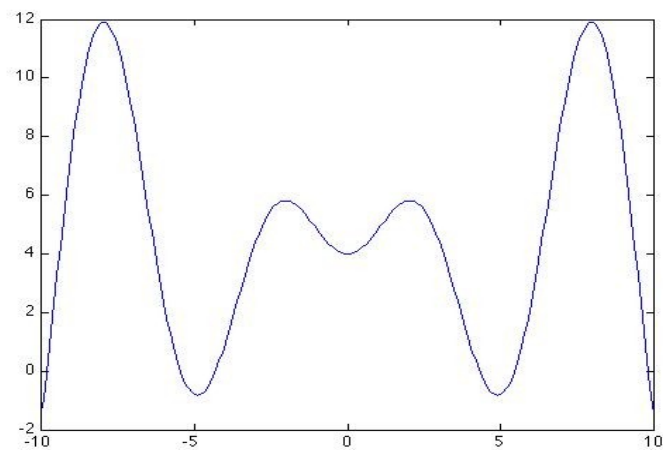
EDU>> fzero(f,1)

ans =

0.7214

EDU>> **%for g**

EDU>> plot(x,g(x))



```
EDU>> %we'll search for the roots based on the graph
```

```
EDU>> fzero(g,-10)
```

```
ans =
```

```
-9.8433
```

```
EDU>> fzero(g,-6)
```

```
ans =
```

```
-5.4613
```

```
EDU>> fzero(g,-4)
```

```
ans =
```

```
-4.3232
```

```
EDU>> fzero(g,4)
```

```
ans =
```

```
4.3232
```

```
EDU>> fzero(g,6)
```

```
ans =
```

```
5.4613
```

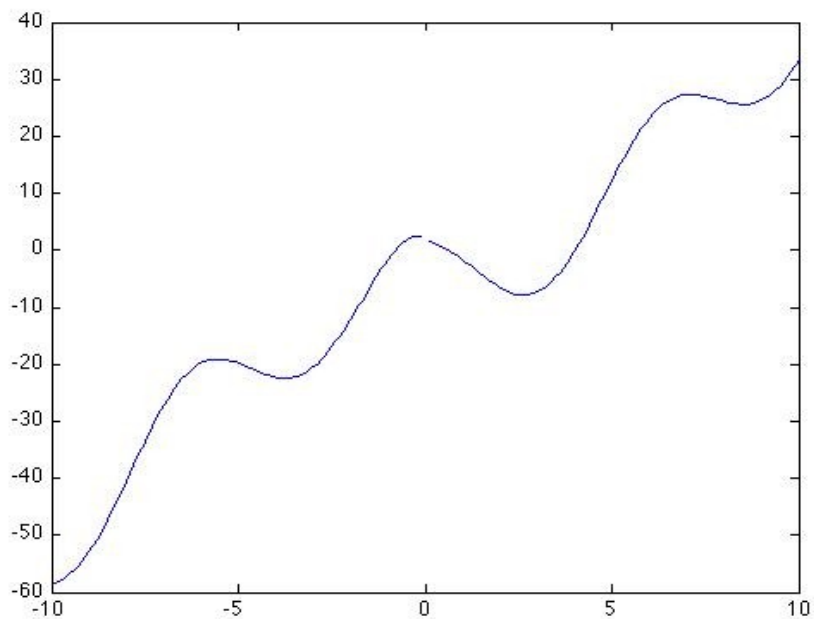
```
EDU>> fzero(g,10)
```

```
ans =
```

```
9.8433
```

```
EDU>> %for h
```

```
EDU>> plot(x,h(x))
```



```
EDU>> %we'll search for the roots based on the graph
```

```
EDU>> fzero(h,-1)
```

```
ans =
```

```
-0.7904
```

```
EDU>> fzero(h,1)
```

```
ans =
```

```
0.5971
```

```
EDU>> fzero(h,4)
```

```
ans =
```

```
4.0128
```

EDU>>% **תרגיל 2ב**

```
EDU>> f=inline('x.^5+4*x.^4+x-2'); g=inline('4+x.*sin(x)'); h=inline('2*x.*log(abs(x))+8*cos(x)-6');
```

```
EDU>> quad(f,-2,3)
```

ans =

323.3333

```
EDU>> quad(g,-2,3)
```

ans =

24.8527

```
EDU>> quad(h,-2,3)
```

ans =

-16.9817

EDU>> % **תרגיל 4א**

```
EDU>> A=eye(5);
```

```
EDU>> B=ones(5);
```

```
EDU>> C=zeros(5);
```

```
EDU>> M=[A,B;B',C]
```

EDU>> % **תרגיל 4ב**

```
EDU>> A=eye(5);
```

```
EDU>> B=-1+2*rand(5,4);
```

```
EDU>> C=3*ones(4);
```

```
EDU>> M=[A,B;B',C]
```

שאלות מיופאד

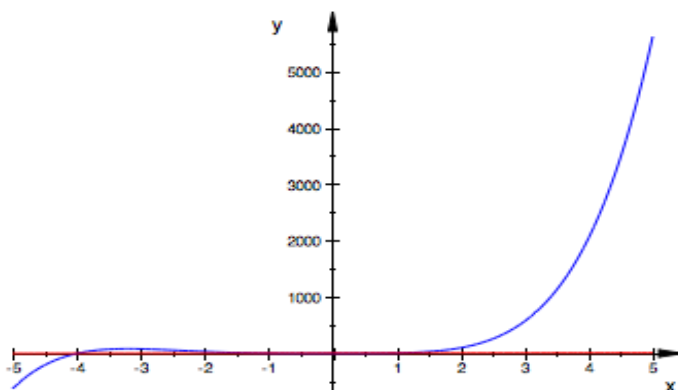
question 1

```
f:=x^5+4*x^4+x-2; g:=4+x*sin(x);
```

```
h:=2*x*ln(abs(x))+8*cos(x)-6;
```

for f:

```
plot(f,x)
```



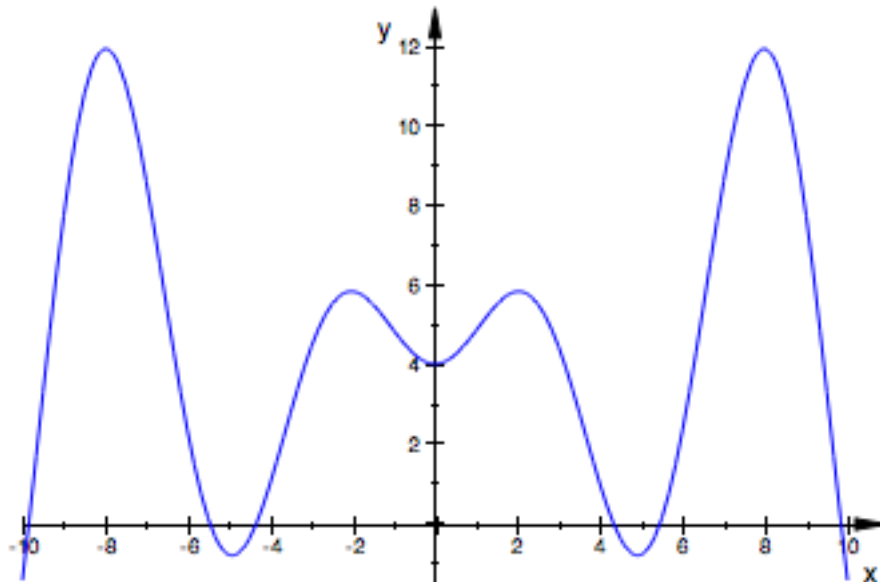
the numeric presentation of the roots is:

```
numeric::solve(f,x)
```

```
{ -3.976089285, -1.0, 0.7213856862, 0.1273517994 - 0.8252636764 i, 0.1273517994 + 0.8252636764 i }
```

for g:

```
plot(g,x=-10..10)
```



we'll search for the roots based on the graph:

```
numeric::solve(g,x=-10..-9); numeric::solve(g,x=-6..-5);
```

```
numeric::solve(g,x=-5..-4); numeric::solve(g,x=4..5);
```

```
numeric::solve(g,x=5..6); numeric::solve(g,x=9..10);
```

```
{ -9.843255271 }
```

```
{ -5.461308013 }
```

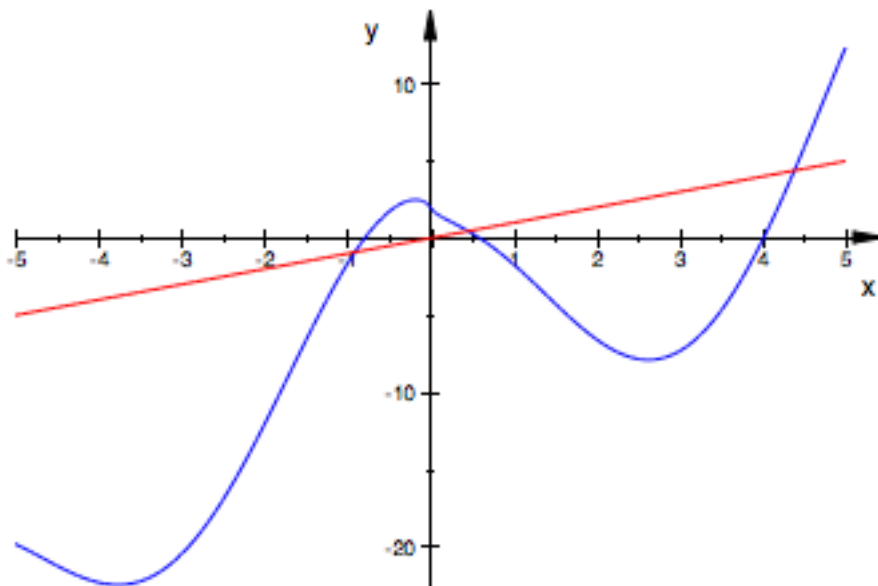
```
{ -4.323239544 }
```

```
{ 4.323239544 }
```

```
{ 5.461308013 }
```

```
{ 9.843255271 }
```

for h:
`plot(h,x)`



we'll search for the roots based on the graph and on our knowledge that this function has no roots that are not between $x=-1$ to $x=5$

`numeric::solve(h,x=-1..0)`

`{ -0.79044416 }`

`numeric::solve(h,x=0..1)`

`{0.5970838272}`

`numeric::solve(h,x=3..5)`

`{4.012776256}`

question 2

for f(x):

`diff(f,x); int(f,x);`

$$5x^4 + 16x^3 + 1$$

$$\frac{x^6}{6} + \frac{4x^5}{5} + \frac{x^2}{2} - 2x$$

for g(x):

`diff(g,x); int(g,x);`

$$\sin(x) + x \cos(x)$$

$$4x + \sin(x) - x \cos(x)$$

for h(x):

diff(h,x); int(h,x)

$$2 \ln(|x|) - 8 \sin(x) + \frac{2 x \operatorname{sign}(x)}{|x|}$$

$$8 \sin(x) - 6 x + x^2 \left(\ln\left(\frac{x}{\operatorname{sign}(x)}\right) - \frac{1}{2} \right)$$

חישובים עבור סעיף ב2

int(f,x=-2..3); int(g,x=-2..3); int(h,x=-2..3);

$$\frac{970}{3}$$

$$\sin(2) - 3 \cos(3) - 2 \cos(2) + \sin(3) + 20$$

$$\ln\left(\frac{19683}{16}\right) + 8 \sin(2) + 8 \sin(3) - \frac{65}{2}$$

question 3

הסברים כלליים אפשר לראות באתר של המתרגל מר גרישה אושרוביץ, תרגול 2.