DIGITAL ASSESSMENT – 2

Course name: Calculus for Engineers
Course Code: MAT1011
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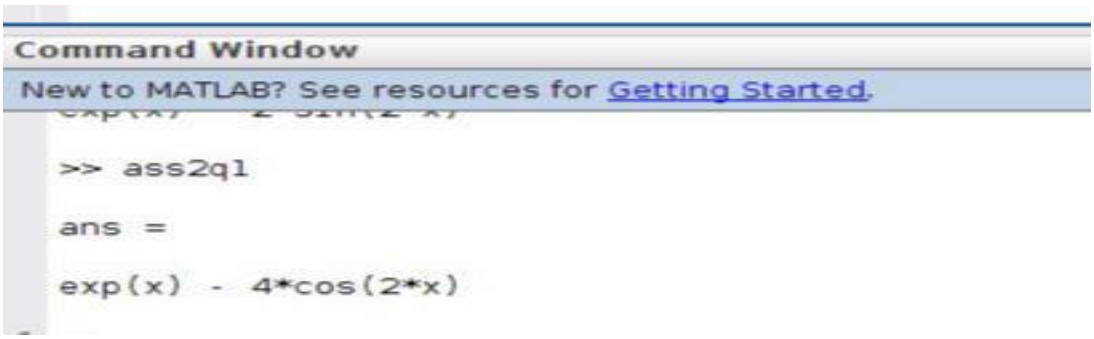
Slot: L5+L6

1. Write a MATLAB code to find the second derivative of $y=e^x+\cos 2x+1$ with respect to x and execute it.

CODE:

OUTPUT:



2. Write a MATLAB code to find the extreme values of the function $f(x)=x^4-8x^2-2$ and execute it. Also visualize it.

CODE:

untitled.m | yo.m | ass1q1.m | untitled2 | ass1q2.m | ass2q1.m | +

```
syms x
f=input('enter the function f(x):');
fx=diff(f,x);
ax=solve(fx)
fxx=diff(fx,x);
D=fxx;
figure
ezplot(f,[min(double(ax))-.5,max(double(ax))+.5]);
for i=1:1:size(ax)
    T1=subs(D,x,ax(i));
    T2=subs(f,x,ax(i));

if(double(T1)==0)
    sprintf('the point %d needs furthe investigation',double(ax(i)))
elseif(double(T1)<0)
    sprintf('the maximum value of the function is %d at the point %d',double(T2),double(ax(i)))
    st='y.';
else
    sprintf('the minimum value of the function is %d at the point %d',double(T2),double(ax(i)))
    st='k*';
end
hold on
plot(double(ax(i)),double(T2),st,'markersize',20);
end
```

OUTPUT:

```
>> yo
enter the function f(x):x^4-8*x^2-2

ax =

 -2
  0
  2


ans =

the minimum value of the function is -18 at the point -2


ans =

the maximum value of the function is -2 at the point 0


ans =

the minimum value of the function is -18 at the point 2
```

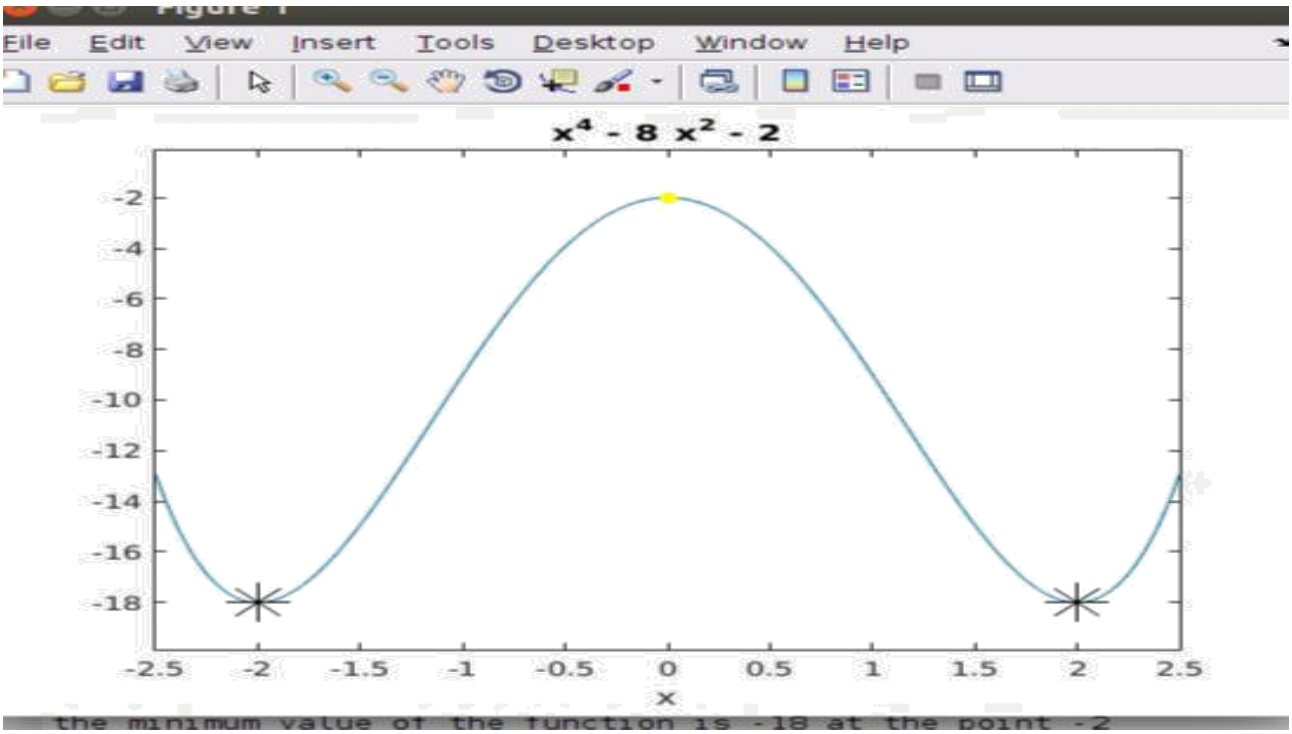


Figure 1
File Edit View Insert Tools Desktop Window Help
$x^4 - 8\,x^2 - 2$
-2
-4
-6
-8
-10
-12
-14
-16
-18
-2.5 -2 -1.5 -1 -0.5 0 0.5 1 1.5 2 2.5
x
the minimum value of the function is -18 at the point -2