LAVANYA V

21BEC1517

CALCULUS FAT

1.

Question **1**

Not yet answered

Marked out of 10.00

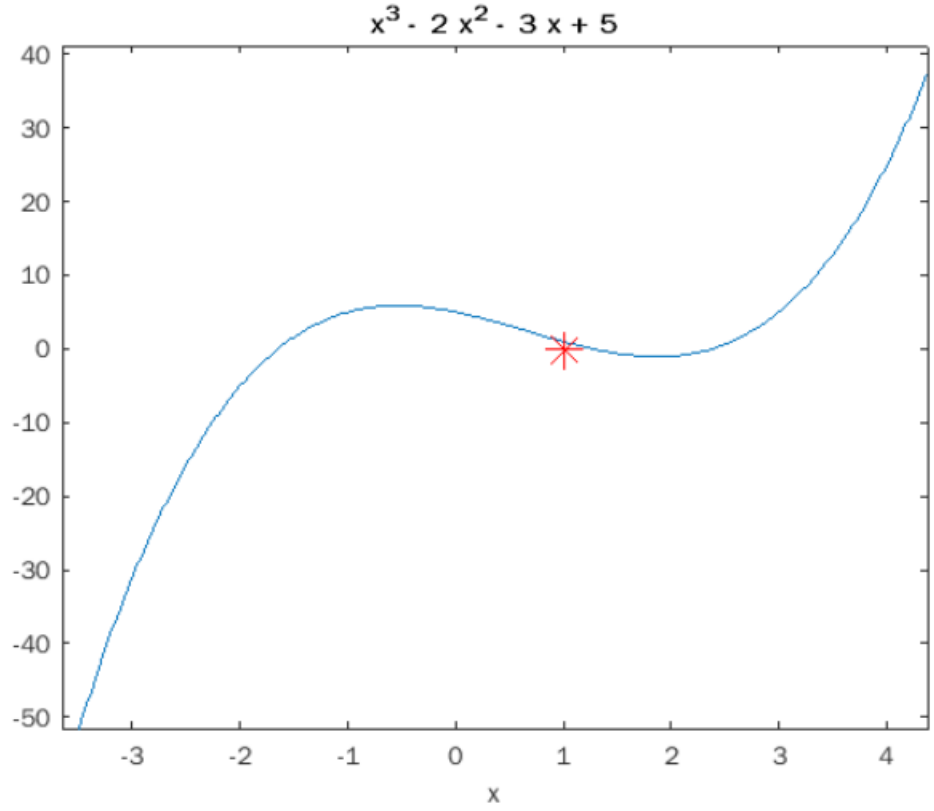
Flag question

By using MATLAB, draw the surface of $f(x) = x^3 + 2x^2 - 3x + 5$ with in the domain [-4,4] and print its critical points.

Answer:

FATQN1.m

```
%%LAVANYA V
%21BEC1517
%%QUESTION 1
clc
clear all
syms x
f=x^3-2*x^2-3*x+5;
ezsurf(f,[-4,4])
print('surface plot')
fx=diff(f,x);
fxx=diff(fx,x);
c=solve(f)
cmin=min(double(c));
cmax=max(double(c));
ezplot(f,[cmin-2,cmax+2])
hold on
for i=1:1:size(c)
    y=subs(f,x,c(i));
    fprintf('\ncritical points %d',double(c(i)));
end
plot(double(y),'r*','markersize',15);
hold on
```




Command Window

```
c =

root(z^3 - 2*z^2 - 3*z + 5, z, 1)
root(z^3 - 2*z^2 - 3*z + 5, z, 2)
root(z^3 - 2*z^2 - 3*z + 5, z, 3)


critical points 1.273891e+00
critical points -1.651093e+00
critical points 2.377203e+00
>>
```

Question **2**

Not yet answered

Marked out of 10.00

Flag question

By using MATLAB commands find the Taylor series of $x^2y + 3y - 2$ in powers of x-1 and y+2 upto second degree.

Answer:

```
%%LAVANYA V
%21BEC1517
clc
clear all
syms x y
f = x^2*y+3*y-2;
T = taylor(f, [x, y], [1, 1], 'Order', 2)
```

Command Window

```
T =

2*x + 4*y - 4

>>
```

Question **3**

Not yet answered

Marked out of 20.00

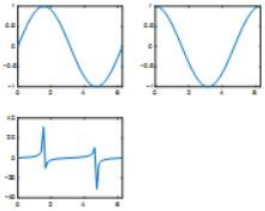
Flag question

Time left 1:02:26

(a) Debug the following code in order to get the following figures as output

```
x = linespace(0,2pi,50);
    y = sin(x);
    z = cos(x);
    w = tanx);
    subplot (2,1, 1)
    plot (x, y)
    subplot (2, 1,2)
    plot(x, z)
    subplot (2,2,3)
    plot(x, w)
```

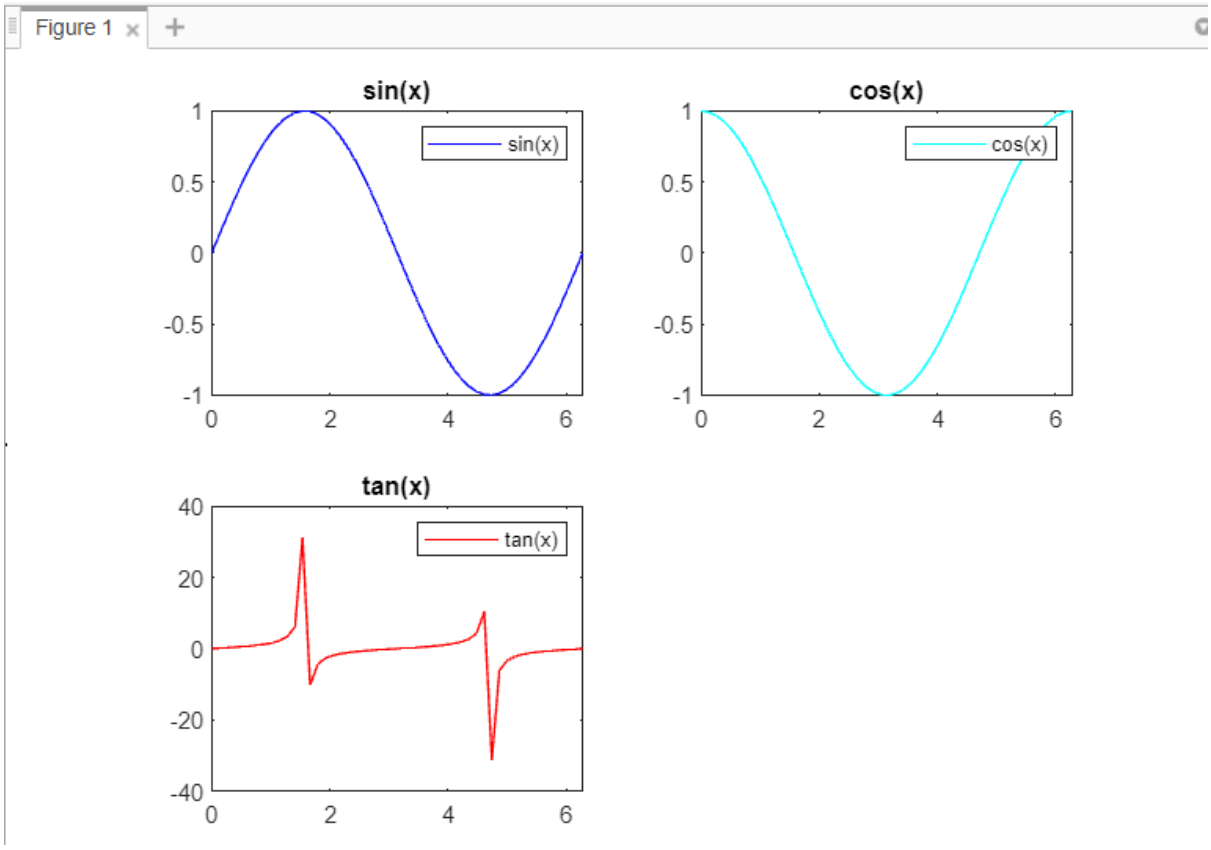
Output



(b) Modify the above code and add the following
(i) title to the graph, (ii) legend, (iii) change the colours of the graph.
(iv) Use hold on function and paste your out put in each step.

Answer:

```
%%LAVANYA V
%21BEC1517
%%title
clc
clear all
x=linspace(0,2*pi,50);
hold on
y=sin(x);
z=cos(x);
w=tan(x);
subplot(2,2,1)
plot(x,y,'b')
title('sin(x)')
legend('sin(x)')
subplot(2,2,2)
plot(x,z,'c')
title('cos(x)')
legend('cos(x)')
subplot(2,2,3)
plot(x,w,'r')
title('tan(x)')
legend('tan(x)')
hold off
```




Question **4**

Not yet answered

Marked out of 2.00

Flag question

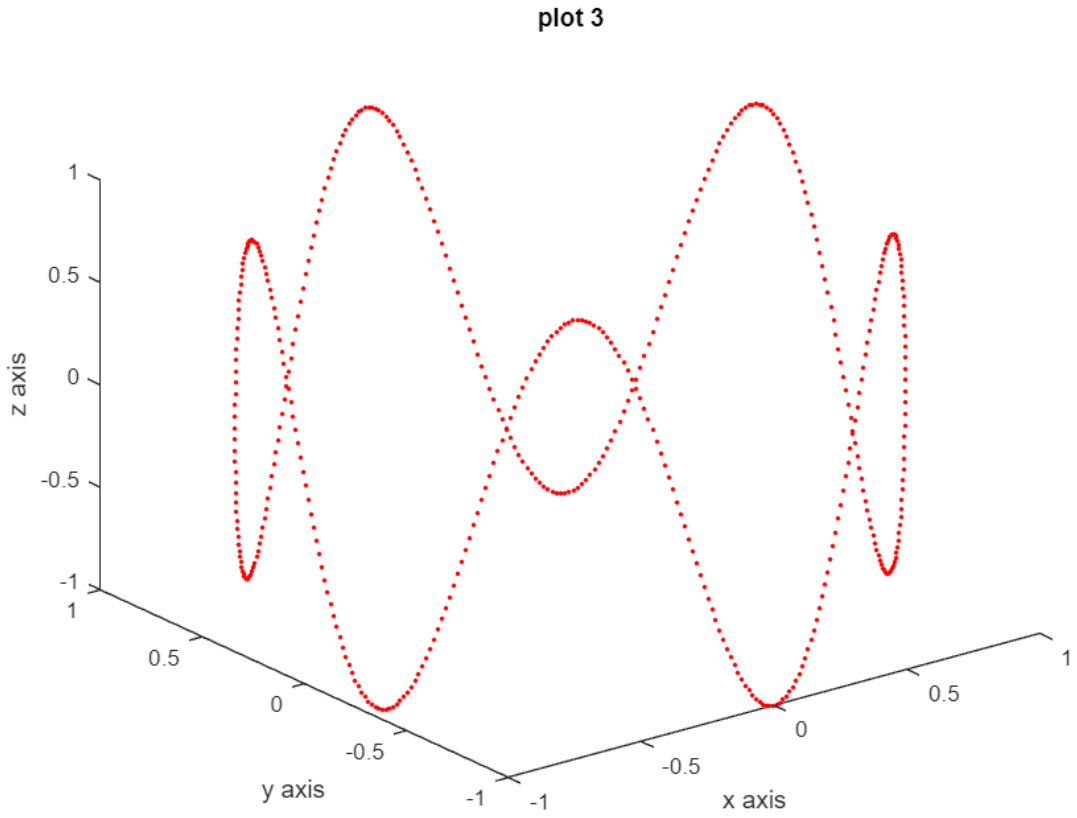
1. Explain the following syntax with an example Figure

Answer:

`plot3(X,Y,Z)` plots coordinates in 3-D space.

- To plot a set of coordinates connected by line segments, specify `X`, `Y`, and `Z` as vectors of the same length.
- To plot multiple sets of coordinates on the same set of axes, specify at least one of `X`, `Y`, or `Z` as a matrix and the others as vectors.

```
%Lavanya (21BEC1517)
%plot 3
t=linspace(0,2*pi,500);
x=cos(t);
y=sin(t);
z=sin(5*t);
comet3(x,y,z)
plot3(x,y,z,'r.')
xlabel('x axis')
ylabel('y axis')
zlabel('z axis')
title('plot 3')
```




Question **5**

Not yet answered

Marked out of 2.00

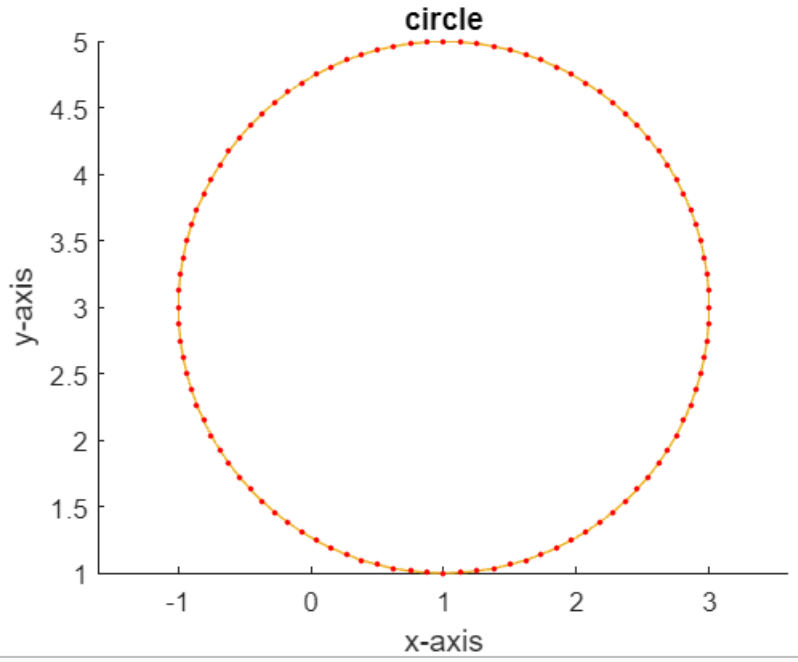
Flag question

1. Explain the following syntax with an example Holdon

Answer:

- `hold on` retains plots in the current axes so that new plots added to the axes do not delete existing plots.
- `hold off` sets the hold state to off so that new plots added to the axes clear existing plots and reset all axes properties.
- `hold all` is the same as `hold on`.
- Use single quotes around the `'on'` and `'off'` inputs, such as `hold(ax,'on')`.

```
%Lavanya (21BEC1517)
%circle with centre(1,3)
clc
clear all
function h = circle(x,y,r)
hold on
th = 0:pi/50:2*pi;
xunit = 1+2 * cos(th);
yunit = 3+2 * sin(th);
h = plot(xunit, yunit,'r.');
axis equal
xlabel('x-axis')
ylabel('y-axis')
title('circle')
hold off
end
```



Question **6**

Not yet answered

Marked out of 2.00

Flag question

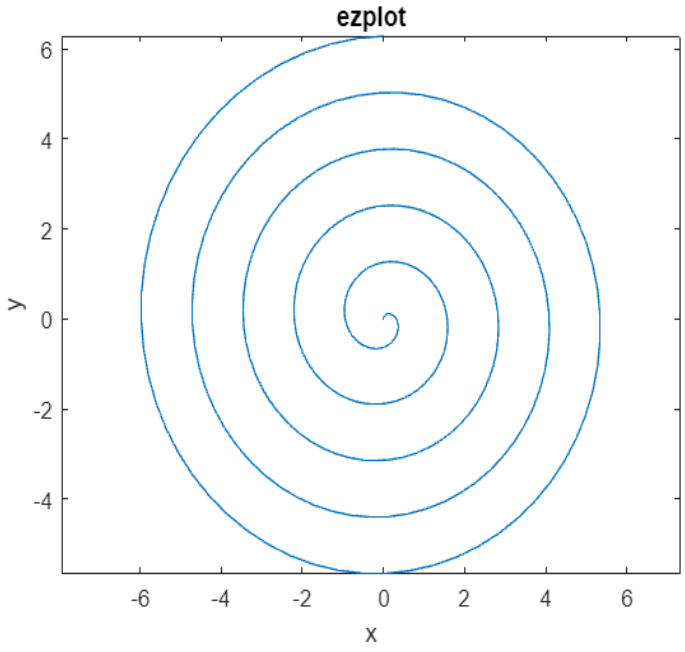
Time left 1:00:

1. Explain the following syntax with an example Ezplot

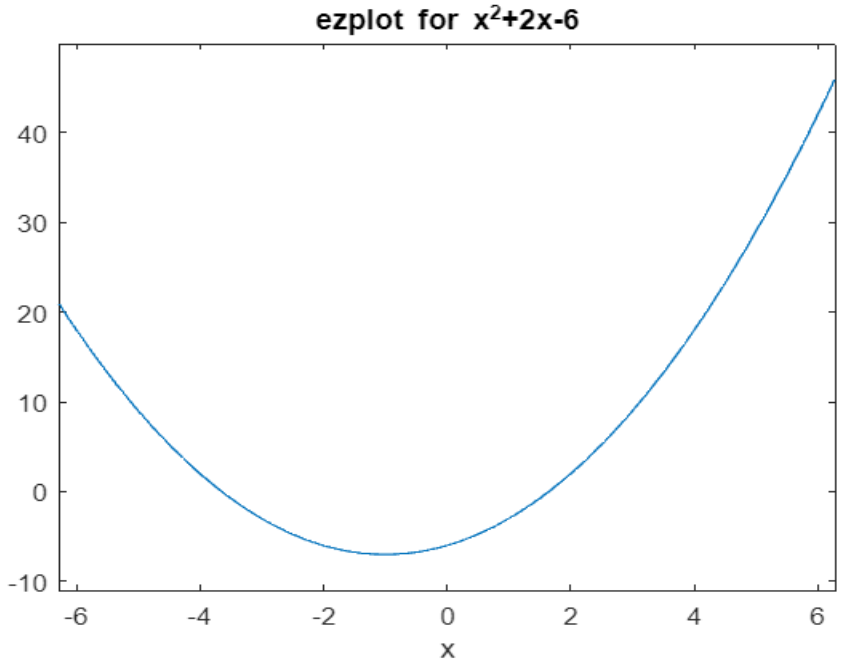
Answer:

- `ezplot(f)` plots the curve defined by the function `y = f(x)` over the default interval `[-2π 2π]` for `x`.
- `ezplot` automatically adds a title and axis labels to the plot.

```
%Lavanya (21BEC1517)
%ezplot
syms t
x=t*sin(5*t);
y=t*cos(5*t);
ezplot(x,y)
title('ezplot')
```




```
%Lavanya (21BEC1517)
%ezplot for x^2+2x-6
syms x
y=x^2+2*x-6
ezplot(y)
title('ezplot for x^2+2x-6')
```




Question **7**

Not yet answered

Marked out of 2.00

Flag question

1. Explain the following syntax with an example Print

Answer:

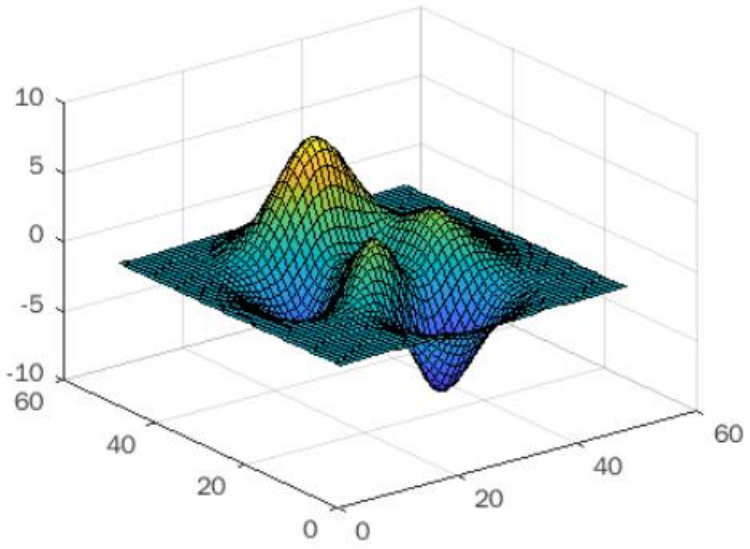
`print(filename,formattype)` saves the current figure to a file using the specified file format, such as `print('BarPlot','-dpng')`. If the file name does not include an extension, then `print` appends the appropriate one.

`print(filename,formattype,formatoptions)` specifies additional options that are available for some formats.

example

`print` prints the current figure to the default printer.

```
%%LAVANYA V
%21BEC1517
clc
clear all
surf(peaks)
cdata = print('-RGBImage');
```




Question **8**

Not yet answered

Marked out of 2.00

Flag question

1. Explain the following syntax with an example For loop

Answer:

`for index = values, statements, end` executes a group of statements in a loop for a specified number of times. *`values`* has one of the following forms:

- *`initVal`*`:`*`endVal`* — Increment the *`index`* variable from *`initVal`* to *`endVal`* by `1`, and repeat execution of *`statements`* until *`index`* is greater than *`endVal`*.
- *`initVal`*`:`*`step`*`:`*`endVal`* — Increment *`index`* by the value *`step`* on each iteration, or decrements *`index`* when *`step`* is negative.
- *`valArray`* — Create a column vector, *`index`*, from subsequent columns of array *`valArray`* on each iteration. For example, on the first iteration, *`index`* `=` *`valArray`*`(:,1)`. The loop executes a maximum of *`n`* times, where *`n`* is the number of columns of *`valArray`*, given by `numel(`*`valArray`*`(1,:))`. The input *`valArray`* can be of any MATLAB® data type, including a character vector, cell array, or struct.

```
%%LAVANYA V
%21BEC1517
%forloop
clc
clear all
for v = 1.0:-0.2:0.0
   disp(v)
end
```

Command Window

```
    1

    0.8000

    0.6000

    0.4000

    0.2000

    0

>>
```