# **MAT 1011**

**MATLAB** 



# Digital Assignment – 2

L31+L32
FALL SEMESTER 2019-20

by

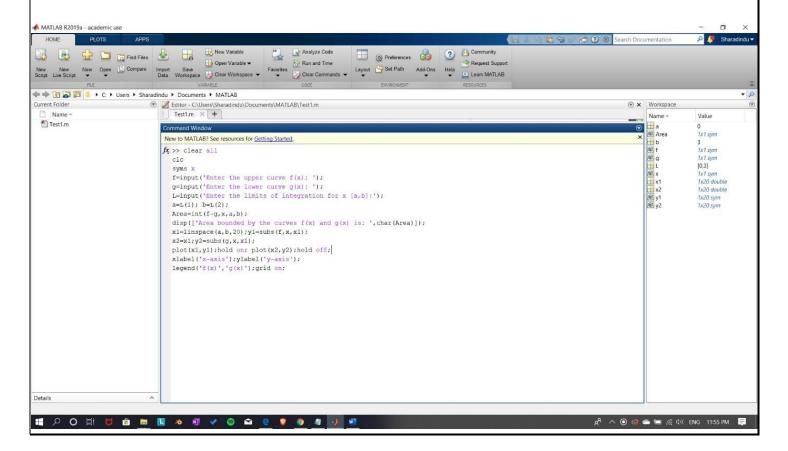
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#### **Problem:**

Find the area of the region bounded by the curve  $y = x^2 - 2x$  and the line y = x.

#### Code in MATLAB:

```
clear all; clc; syms x; f=input('Enter the upper curve f(x): '); g=input('Enter the lower curve g(x): '); L=input('Enter the limits of integration for x [a,b]:'); a=L(1); b=L(2); Area=int(f-g,x,a,b); disp(['Area bounded by the curves f(x) and g(x) is: ',char(Area)]); x1=linspace(a,b,20);y1=subs(f,x,x1); x2=x1;y2=subs(g,x,x1); plot(x1,y1);hold on; plot(x2,y2);hold off; xlabel('x-axis');ylabel('y-axis'); legend('f(x)','g(x)'); grid on;
```



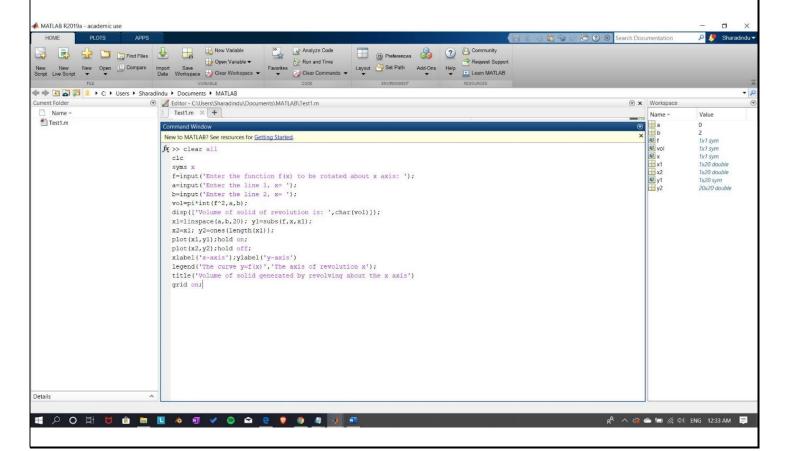
# Input: Enter the upper curve f(x): xEnter the lower curve g(x): $(x^2)-(2*x)$ Enter the limits of integration for x [a,b]:[0,3]**Output:** Area bounded by the curves f(x) and g(x) is: 9/2♠ MATLAB R2019a - academic use PLOTS HOME New New Open Compare Under Understand Variable Open Compare Under Understand Variable Open Variable 🔷 🔷 🛅 🔊 🥦 🕨 C: 🕨 Users 🕨 Sharadindu 🕨 Documents 🕨 MATLAB ● Z Editor - C:\Users\Sharadindu\Documents\MATLAB\Test1.m Name = Name + 0 1x1 sym Test1.m Command Window New to MATLAB? See resources for <u>Getting Started</u>. 3 1x1 sym 1x1 sym [0,3] 1x1 sym 1x20 double 1x20 double 1x20 sym 1x20 sym Enter the upper curve f(x): xEnter the lower curve g(x): $(x^2)-(2^kx)$ Enter the limits of integration for x [a,b]:[0,3]Area bounded by the curves f(x) and g(x) is: 9/2Details 🔃 🐞 🗹 🗸 🖯 🙀 🗓 🗸 🗓 🕺 \land 🔘 🧆 🐔 🖃 🜐 Ф)) ENG 01:29 АМ 🌹 **Graph:** Figure 1 File Edit View Insert Tools Desktop Window Help f(x) 2.5 0.5 0.5 2.5 💆 前 🗎 🔼 🔊 🗊 🗸 🕞 😭 🤨 💿 🥒 🌗 🙎 🔨 🚳 📤 🗺 🌈 📢) ENG 12:03 AM

#### **Problem:**

Find the volume of the solid generated by revolving about the x-axis the region bounded by the curve  $y = \frac{4}{x^2+4}$ , the x-axis, and the lines x = 0 and x = 2.

#### Code in MATLAB:

```
clear all;
clc;
syms x
f=input('Enter the function f(x) to be rotated about x axis: ');
a=input('Enter the line 1, x= ');
b=input('Enter the line 2, x= ');
vol=pi*int(f^2,a,b);
disp(['Volume of solid of revolution is: ',char(vol)]);
x1=linspace(a,b,20); y1=subs(f,x,x1);
x2=x1; y2=ones(length(x1));
plot(x1,y1);hold on;
plot(x2,y2);hold off;
xlabel('x-axis');ylabel('y-axis')
legend('The curve y=f(x)','The axis of revolution x');
title('Volume of solid generated by revolving about the x axis');
grid on;
```



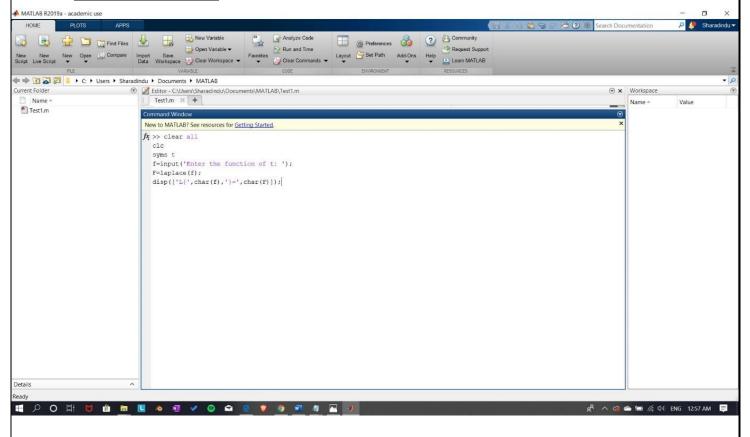
## Input: Enter the function f(x) to be rotated about x axis: $4/((x^2)+4)$ Enter the line 1, x=0Enter the line 2, x=2**Output:** Volume of solid of revolution is: pi\*(pi/4 + 1/2)Now New Open © Compare Impact Size Preferences S Community Analyze Code New New Open Compare Import Save Open Variable Script Live Script Current Folder Nam a a b f vol x x1 x2 Name -Value 1 Test1.m 2 1x1 sym 1x1 sym 1x1 sym 1x20 double 1x20 double 1x20 sym 20x20 double New to MATLAB? See resources for Getting Started. Enter the function f(x) to be rotated about x axis: $4/((x^2)+4)$ Enter the line 1, x= 0 Enter the line 2, x= 2 Volume of solid of revolution is: pi\*(pi/4 + 1/2)Details 🔨 🚳 📤 💷 🦟 Ф)) ENG 01:38 АМ 🌉 **Graph:** Figure 1 File Edit View Insert Tools Desktop Window Help Volume of solid generated by revolving about the x axis The curve y=f(x) The axis of revolution x 0.95 0.9 0.85 S 0.75 0.7 0.65 0.6 0.5 0.2 0.4 0.6 0.8 1.2 1.4 1.6 1.8 ጽ<sup>8</sup> ヘ **○** 😘 📤 铀 🦟 Φ) ENG 12:33 AM

#### Problem:

Find the Laplace transform of the function  $f(t) = \sin 2t \sin 3t$ .

#### Code in MATLAB:

```
clear all
clc
syms t;
f=input('Enter the function of t: ');
F=laplace(f);
disp(['L{',char(f),'}=',char(F)]);
```

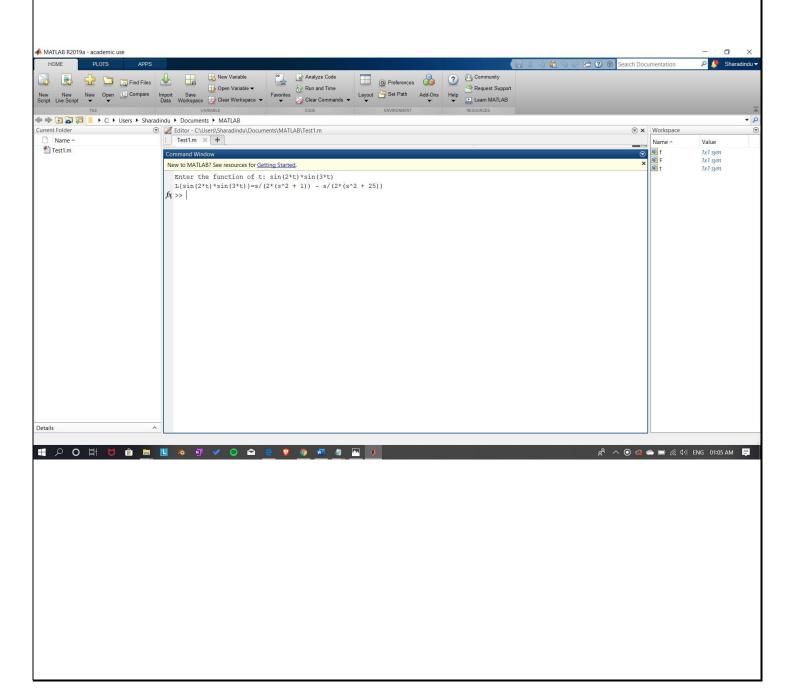


#### Input:

Enter the function of t: sin(2\*t)\*sin(3\*t)

### **Output:**

$$L\{\sin(2*t)*\sin(3*t)\}=s/(2*(s^2 + 1)) - s/(2*(s^2 + 25))$$

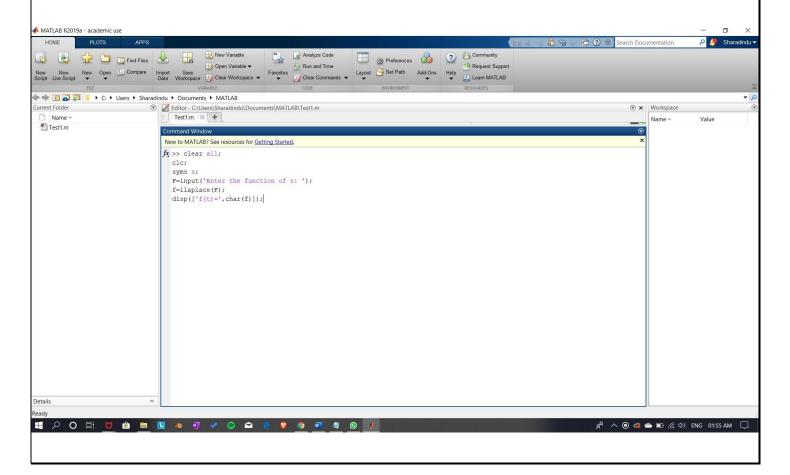


#### Problem:

Find the inverse Laplace transform of the function  $F(s) = \frac{s^2 + 2s - 4}{(s^2 + 2s + 5)(s^2 + 2s + 2)}$ 

#### Code in MATLAB:

```
clear all;
clc;
syms s;
F=input('Enter the function of s: ');
f=ilaplace(F);
disp(['f(t)=',char(f)]);
```



#### Input:

Enter the function of s:  $((s^2)+(2*s)-4)/(((s^2)+(2*s)+5)*((s^2)+(2*s)+2))$ 

## **Output:**

 $f(t)=(3*\sin(2*t)*\exp(-t))/2 - 2*\exp(-t)*\sin(t)$ 

