Matlab Homework week 6

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1 Plot1

1.1 Description

$$y = cosx[0.5 + \frac{3sinx}{1+x^2}]$$

divide x∈ [0-2π] into 101 parts,plot(x,y).

1.2 Analysis

Use the function plot() directly.

1.3 Codes and Result

Code

```
x=0:2*pi/100:2*pi;
y=cos(x).*(0.5+3*sin(x)./(1+x.^2));
plot(x,y);
legend('曲线');
title({'y = cosx[0.5 + \frac{3sinx}{1+x^2}]'},'Interpreter','Latex');
xlabel('x')
ylabel('y')
```

Figure

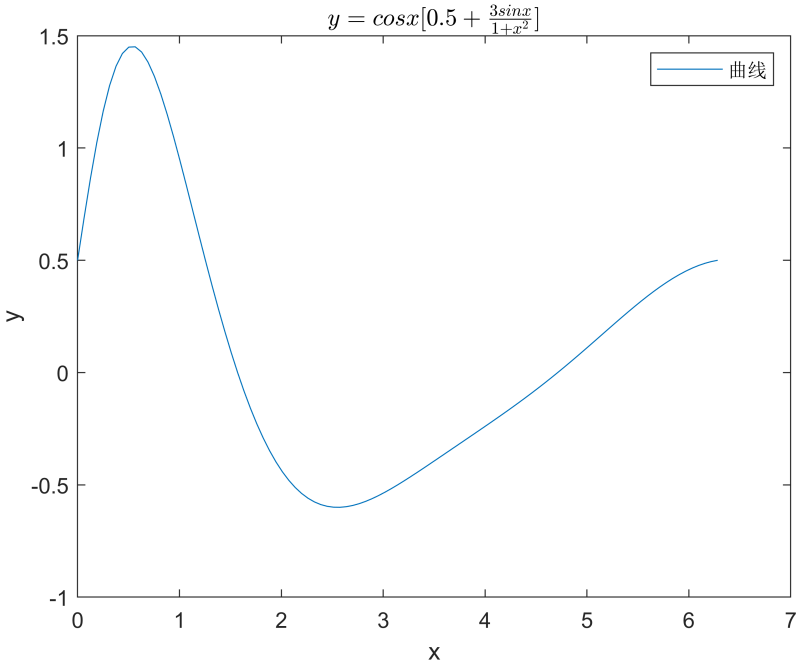

Figure 1: *Plot* $y - x$

2 Signal wave Plot

2.1 Description

Plot f_1,f_2:

$$f_1(t) = (2 - e^{(} - t)u(t))$$
$$f_2(t) = e^{(} - t)cos10\pi t[u(t-1) - u(t-2)]$$
$$t \in [0, 10]$$

2.2 Anaylsis

Use fucntion plot and stepfun to produce the step vector.

Option *title* to produce title name, *xlabel* and *ylabel* to produce the text near the Axis.

Hold on can let codes plot many times on the figure.

legend produce the legend of figure to distinguish different curves.

2.3 Code and Result

Code

```
clear all;
clc;
t=0:0.01:10;
f1=(2-exp(-t)).*(stepfun(t,0));
f2=exp(-t).*cos(10*pi*t).*(stepfun(t,1)-stepfun(t,2));
plot(t,f1);
hold on;
grid on;
plot(t,f2);
title('Signal waveform');
xlabel('x');
ylabel('y');
legend({'$f_1(t)=(2-e^{-t}u(t)$','$f_2(t)=e^{-t}cos10\pi t[u(t-1)-u(t-2)]$'},'Interpreter','Latex');
```

Figure

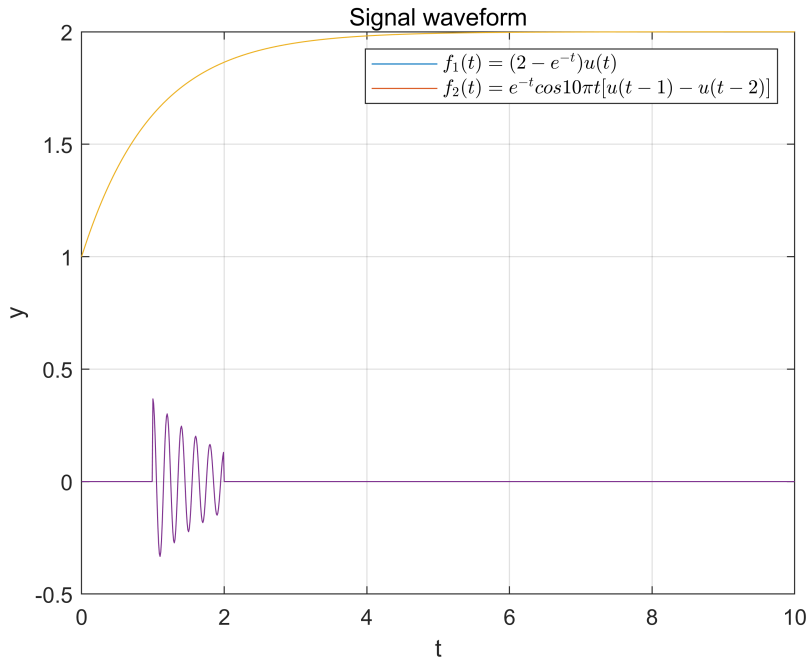

Figure 2: *Plot Signal wave*

3 Parametric Plot

3.1 Description

Plot x-y,

$$x = r \cdot cost + 3t, y = r \cdot sint + 3$$
$$t \in [0, 10], r = 2, 3, 4$$

3.2 Anaylsis

Use t to produce x,y then plot and change option.
gird on to set girds appear on the figure.

3.3 Code and Result

Code

```
t=0:0.01:10;
for r=2:4
    x=r*cos(t)+3*t;
    y=r*sin(t)+3;
    plot(y,x);
    hold on;
end
grid on;
title('$x(y), t \in [0,10]$','Interpreter','Latex');
legend('r=2','r=3','r=4');
ylabel({'$x = r \cdot cost + 3 \cdot t$'},'Interpreter','Latex');
xlabel({'$y = r \cdot cost + 3$'},'Interpreter','Latex');
```

Figure

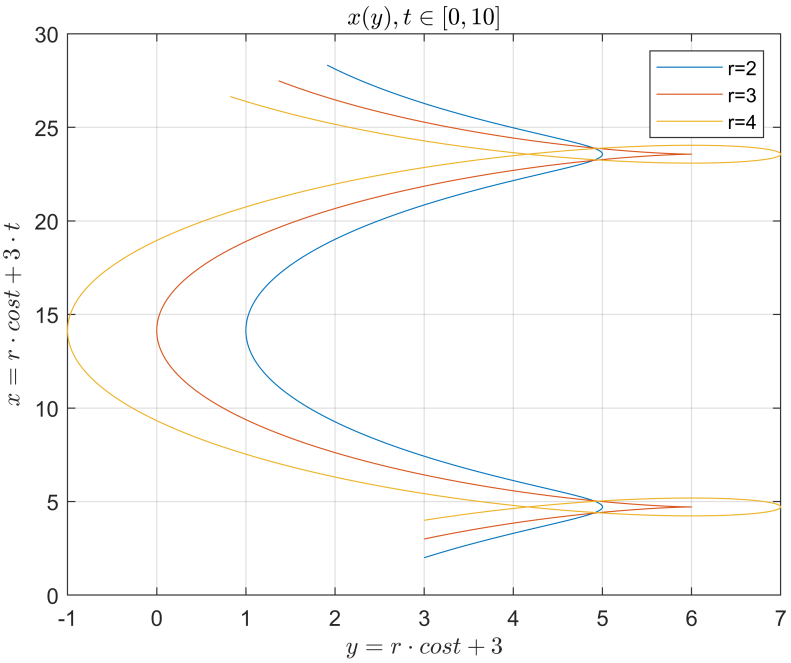

Figure 3: *Parametric Plot*

4 Plot option exercise

4.1 Description

Plot

$y_1 = 1 - sin^2(x)$,$y_2 = 2x + 1$,$t \in [0, 10]$ on the same figure.

requirement:

1.y_1 is figured by blue circle dots,y_2 is figured by green dotted line.

2.use legend.

3.Axis notes.

4.use *gtext* to put **string 'x=5'** onto the position by click.

4.2 Anaylsis

Give the option different commands according to the requirement.

Use *Markersize* and *Linesize* to change the markers and the lines sizes.

4.3 Code and Result

```
x=0:0.1:10;
y1=1-sin(x).^2;
y2=2*x+1;
hold on;
grid on;
plot(x,y1,'bO','Markersize',3);
plot(x,y2,'g--');
title('y1 - x, y2 - x, x \in [0,10]','Interpreter','Latex');
legend({'y1 = 1 - sin^2(x)','y2 = 2x + 1'},'Interpreter','Latex');
axis([0 10 -3 25]);
xlabel('x axis');
ylabel('y axis');
gtext('x=5');
```

Figure

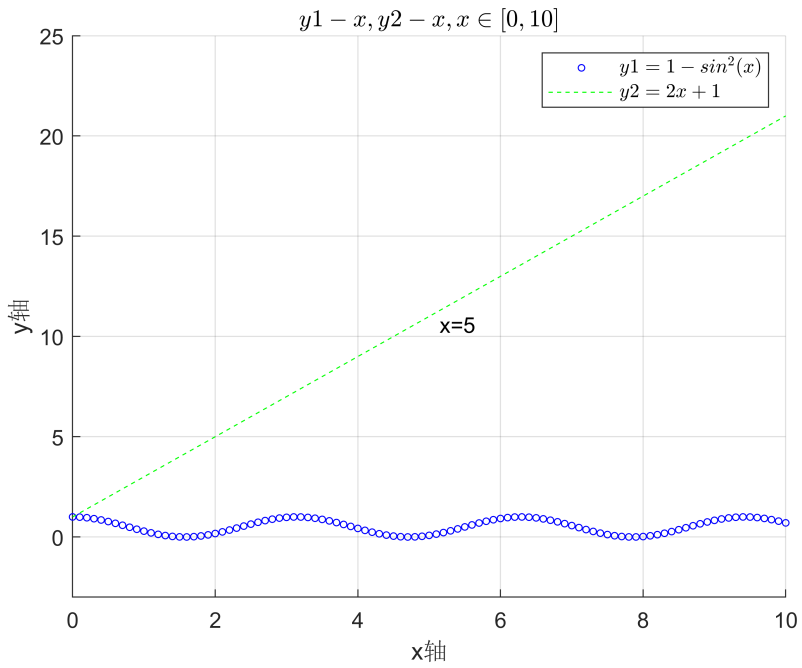

Figure 4: *Options Plot*