大连海事大学
DALIAN MARITIME UNIVERSITY

测控技术与仪器专业
上机实验报告

姓名：_____ 学号：_____

年级班级：_____课程名称：MATLAB 程序设计与实践

上机日期：2020/10/10 指导教师：周怡然

1、

```
>> syms t
>> x=5*cos(t);
>> y=3*sin(t);
>> z=t;
>> fplot3(x,y,z,[0 6*pi],'-+b')
```

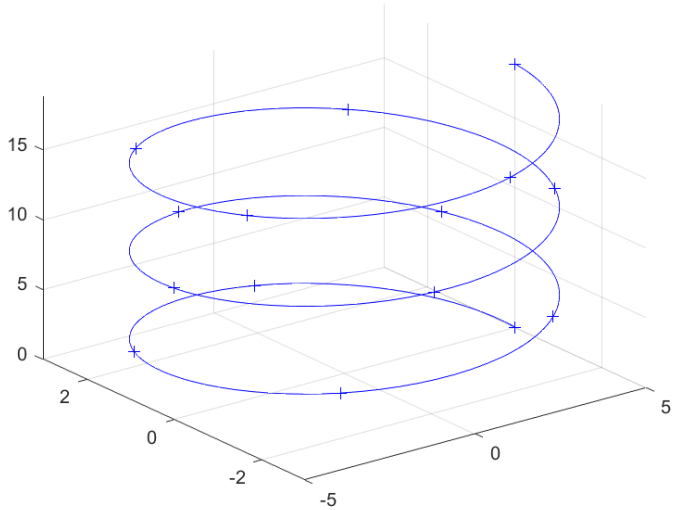

图 1　x=5cost, y=3sint, z=t, t∈[0,6π]的三维曲线图

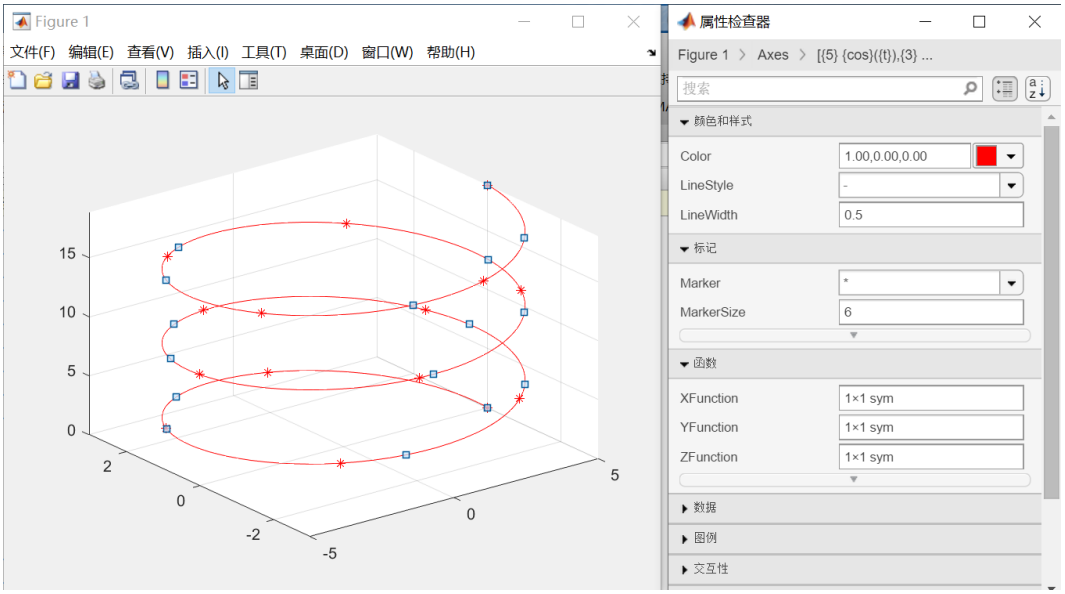

图 2　通过鼠标修改曲线颜色为红色，数据点标记为“*”

2、

（1）

```
>> x=-10:10;
>> y=-10:10;
>> [a,b]=meshgrid(x,y);
z=a.^2+6.*a.*b+b.^2+6.*a+2.*b+1;
>> plot3(a,b,z)
```

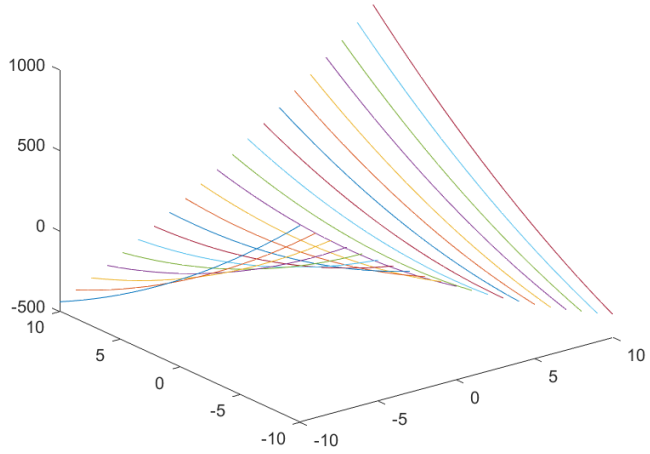

图 3　$z=x^2+6xy+y^2+6x+2y-1$ 的三维曲线图

（2）

```
>> x=-16:0.4:16;
>> y=-4:0.1:4;
>> [a,b]=meshgrid(x,y);
>> z=a.^2./16-b.^2./4;
>> plot3(a,b,z)
```

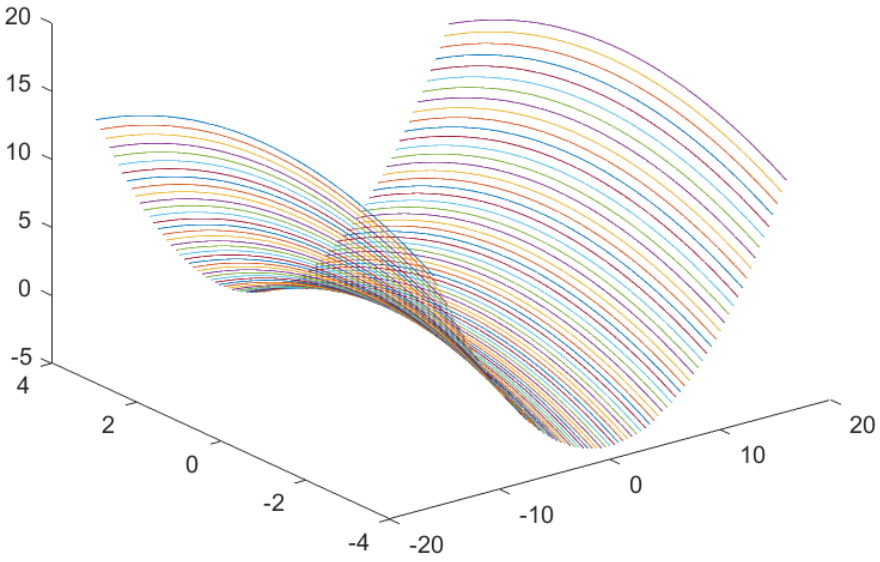

图 4 $z=\frac{x2}{16}-\frac{y2}{16}$ 的三维曲线图

3、

```
>> x=-2:0.1:2;
>> y=-2:0.1:2;
>> [a,b]=meshgrid(x,y);
>> z=a.*exp(-a.^2-b.^2);
>> subplot(1,2,1)
surf(a,b,z)
subplot(1,2,2)
mesh(a,b,z)
```

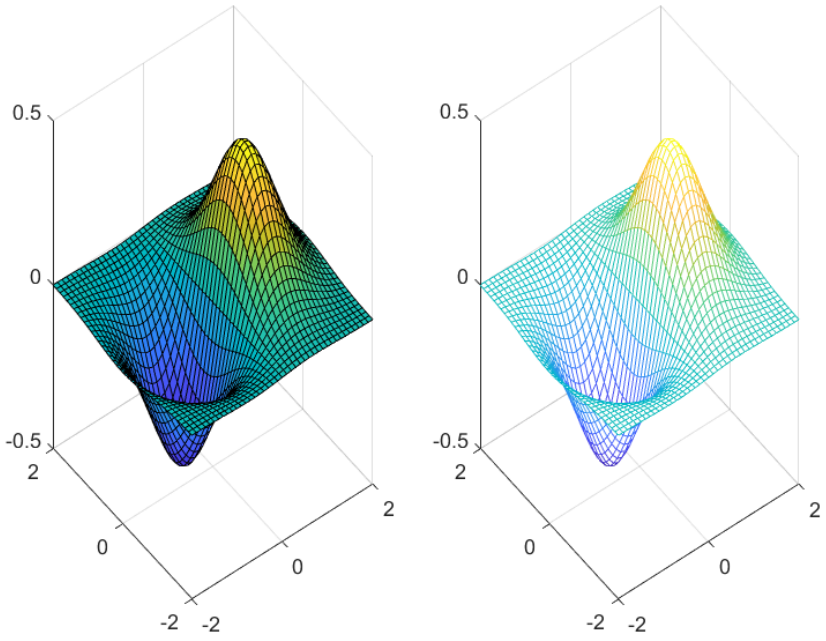

图 5　以一行两列的子图绘制 z=x$e^{-x^2-y^2}$的表面图和网格图

4、

```
>> x=-10:1;
>> y1=x;
>> plot(x,y1,'b')
hold on;
x=1:4;
y2=x.^2
plot(x,y2,'b')
hold on
x=4:10;
y3=2.^x
plot(x,y3,'b')
hold off
```

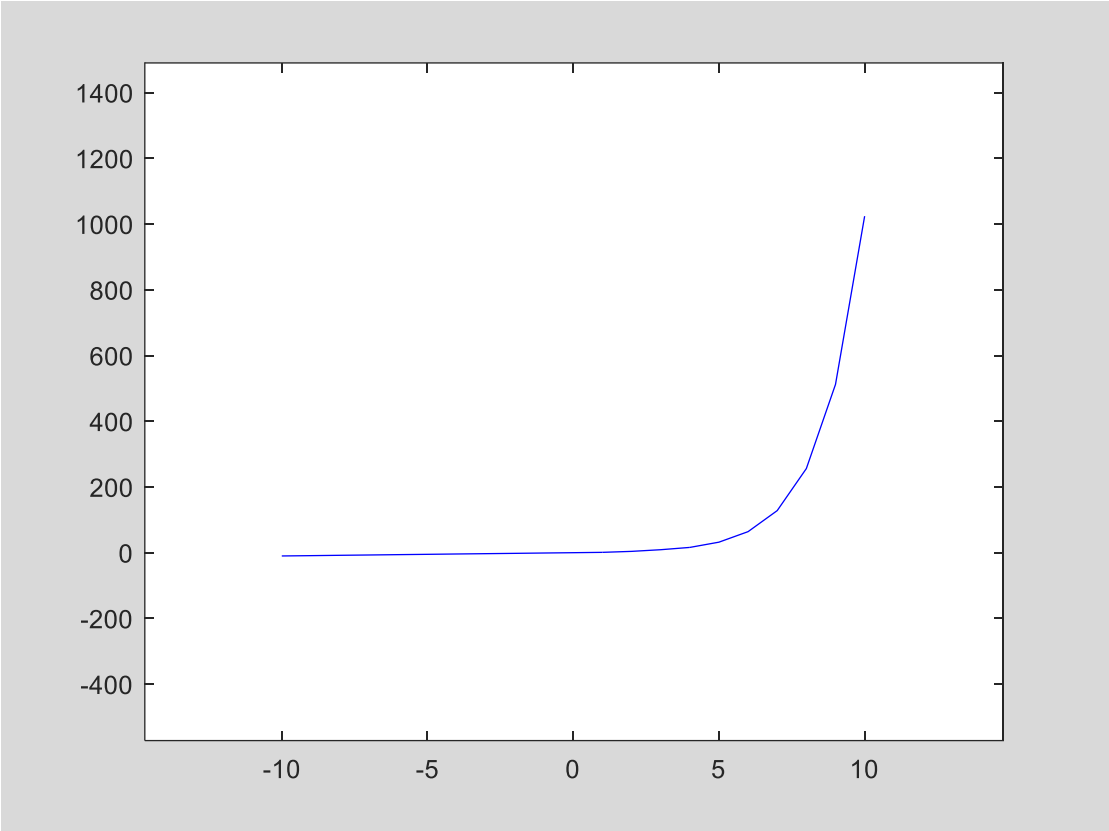

图 6　函数曲线图

5、

（1）

```
>> syms t
>> t=0:pi/100:pi;
>> plot(t,sin(t),'-ob',t,cos(t),'-oc')
text(3,0.4,'sin(t)')
text(2,0,'cos(t)')
legend('sint','cost')
```

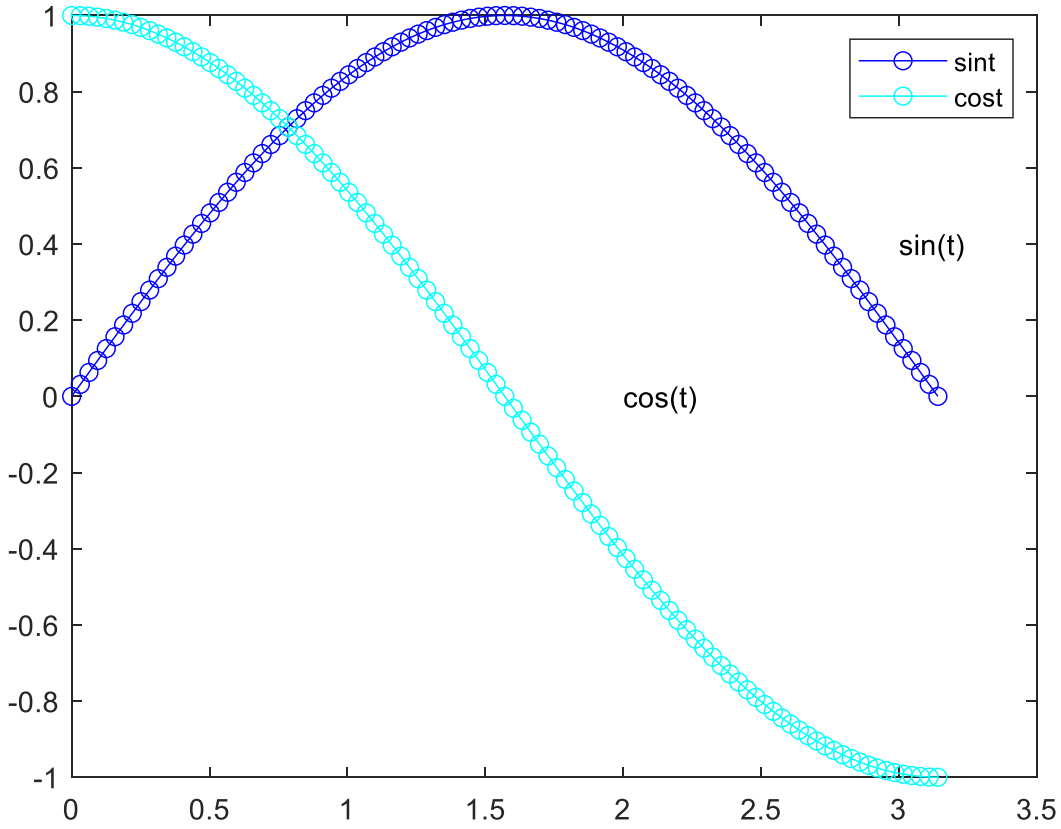

图 7　同一窗口中绘制 sint 和 cost 两条曲线

(2)

```
>> syms t
t=0:pi/100:pi;
>> plot(t,sin(t),'-ob')
text(3,0.4,'sin(t)')
hold on
plot(t,cos(t),'-oc')
text(2,0,'cos(t)')
legend('sint','cost')
hold off
```

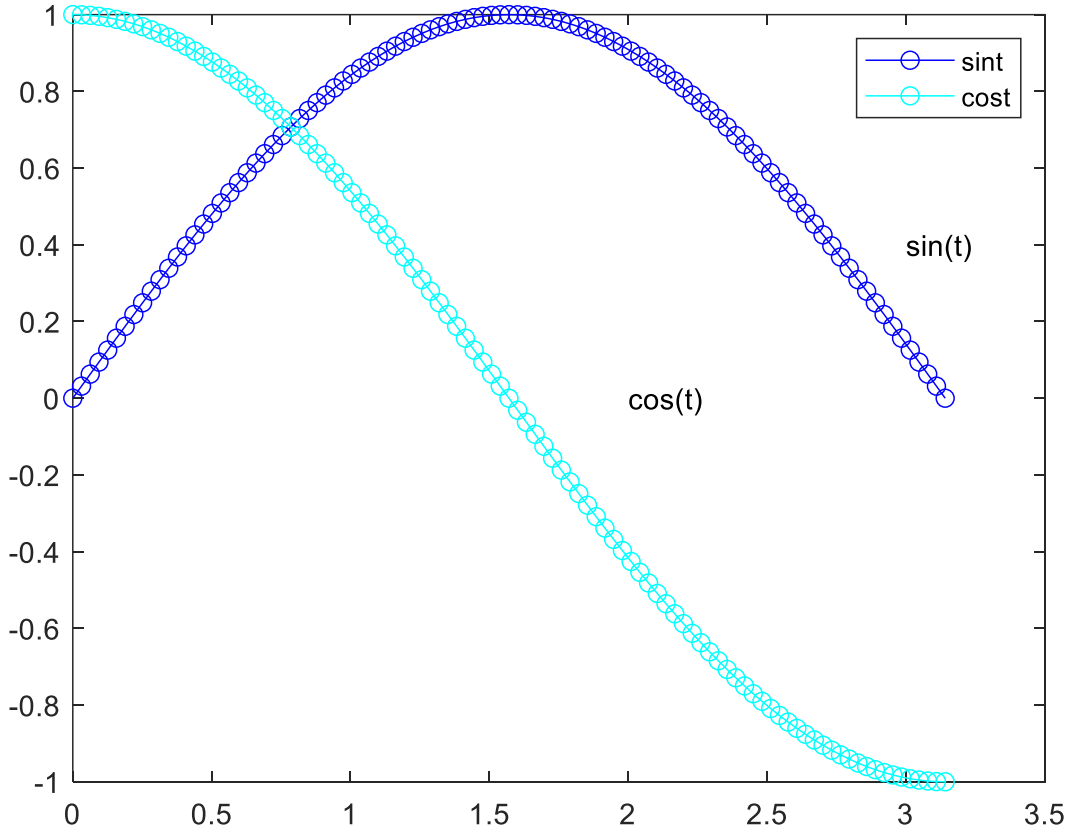

图 8　同一窗口中绘制 sint 和 cost 两条曲线

6、

```
>> figure(1)
x=0:2*pi/20:2*pi;
y=cos(x);
scatter(x,y,'k')
figure(2)
stairs(x,y,'c')
```

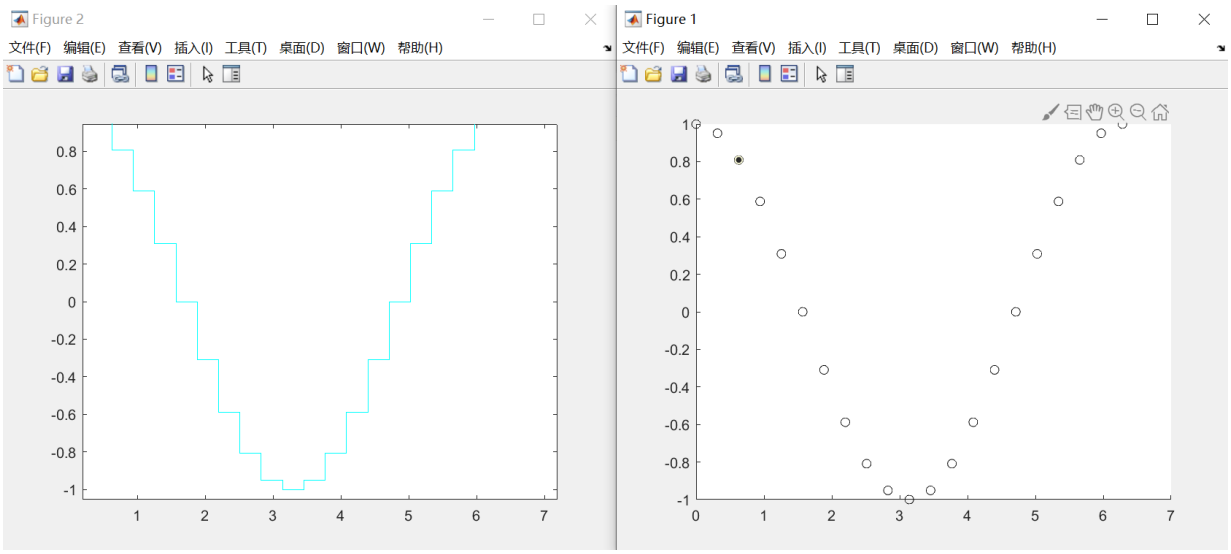

图 9　y=cosx 的散点图和阶梯图