Experiment No 01

BECS 32461

FUNDAMENTALS OF MATLAB FOR DIGITAL SIGNAL PROCESSING

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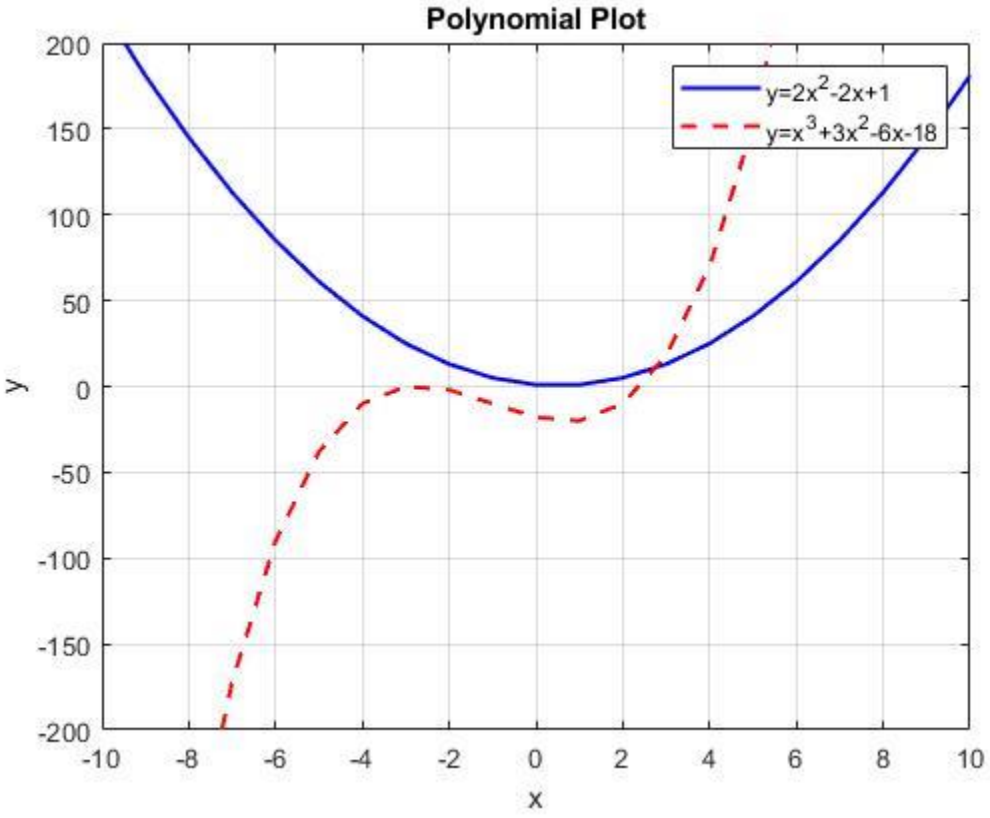
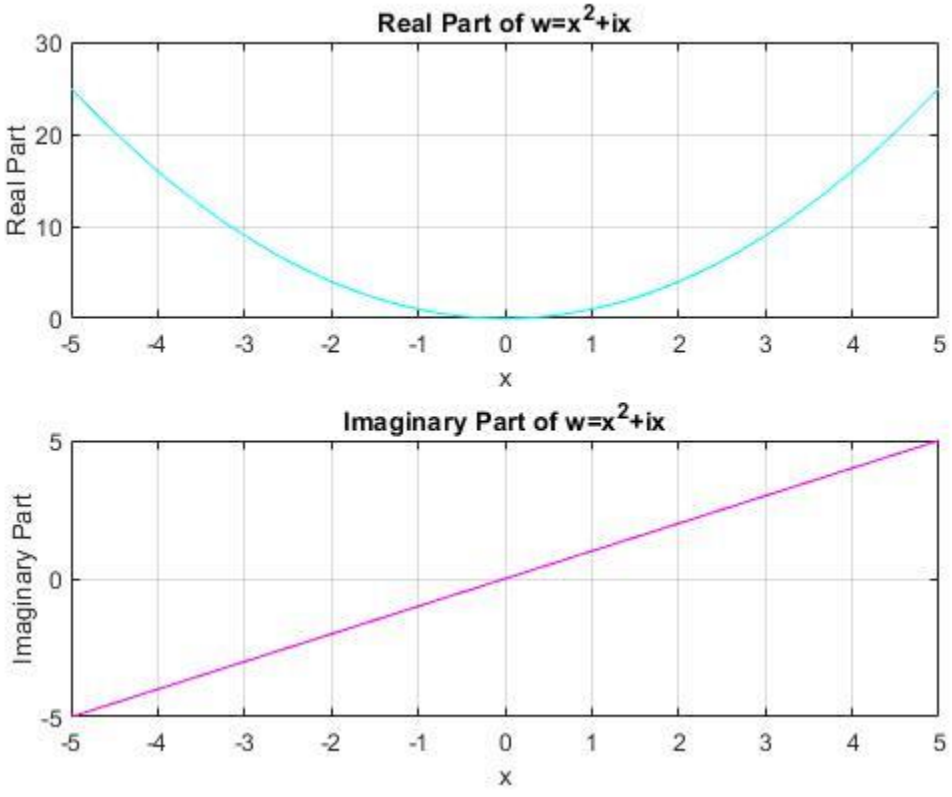
01.

```
x = -10:1:10;
y = 2*x.^2-2*x+1;
z = x.^3+3*x.^2-6*x-18;

plot(x,y,'-b','LineWidth',1.5)
hold on
plot(x,z,'--r','LineWidth',1.5)

legend('y=2x^2-2x+1','y=x^3+3x^2-6x-18')
title('Polynomial Plot')
xlabel('x')
ylabel('y')
axis([-10 10 -200 200])
grid on
```



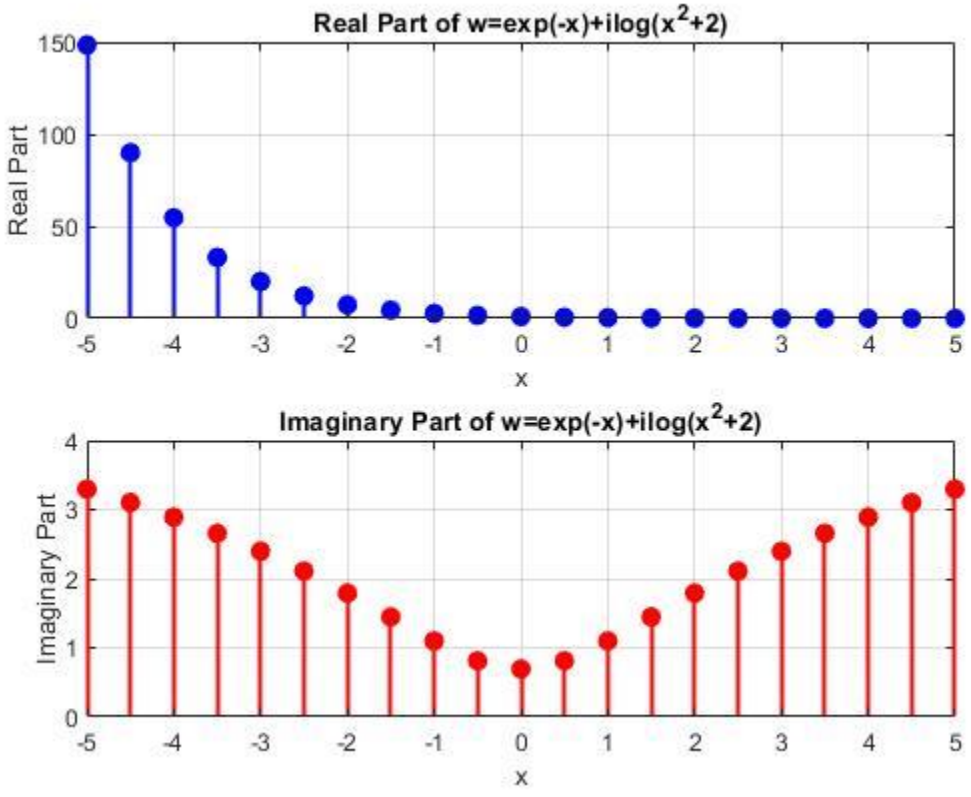
02.

```
subplot(2,1,1);
x = linspace(-5,5);
y1 = x.^2+1i*x;
plot(x,real(y1),'-c')
xlabel('x')
ylabel('Real Part')
title('Real Part of w=x^2+ix')
grid on

subplot(2,1,2);
y2 = x.^2+1i*x;
plot(x,imag(y2),'-m')
xlabel('x')
ylabel('Imaginary Part')
title('Imaginary Part of w=x^2+ix')
grid on
```



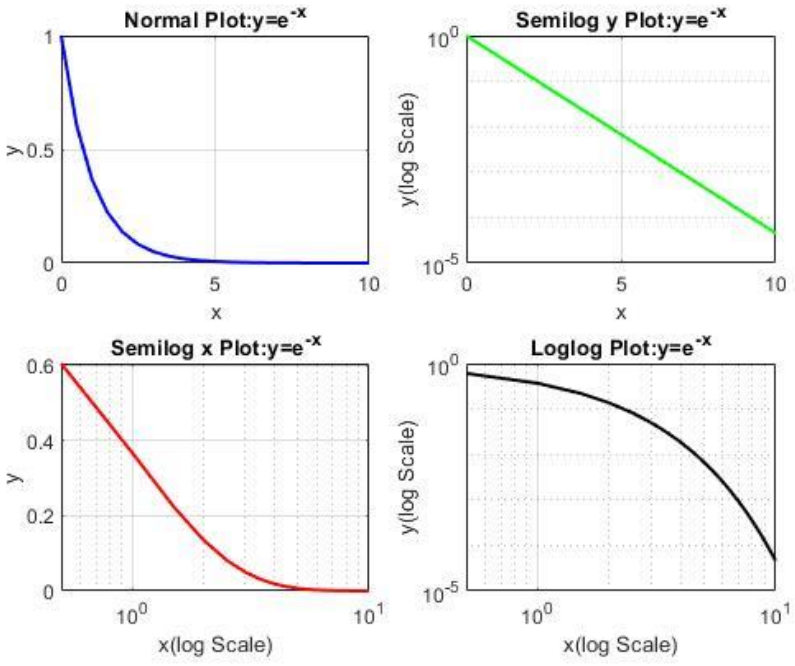
03.

```
subplot(2,1,1);
x = -5:0.5:5;
y1 = exp(-x)+1i*log(x.^2+2);
stem(x,real(y1),'-b','filled','LineWidth',1.5)
xlabel('x')
ylabel('Real Part')
title('Real Part of w=exp(-x)+ilog(x^2+2)')
grid on

subplot(2,1,2);
y2 = exp(-x)+1i*log(x.^2+2);
stem(x,imag(y2),'-r','filled','LineWidth',1.5)
xlabel('x')
ylabel('Imaginary Part')
title('Imaginary Part of w=exp(-x)+ilog(x^2+2)')
grid on
```



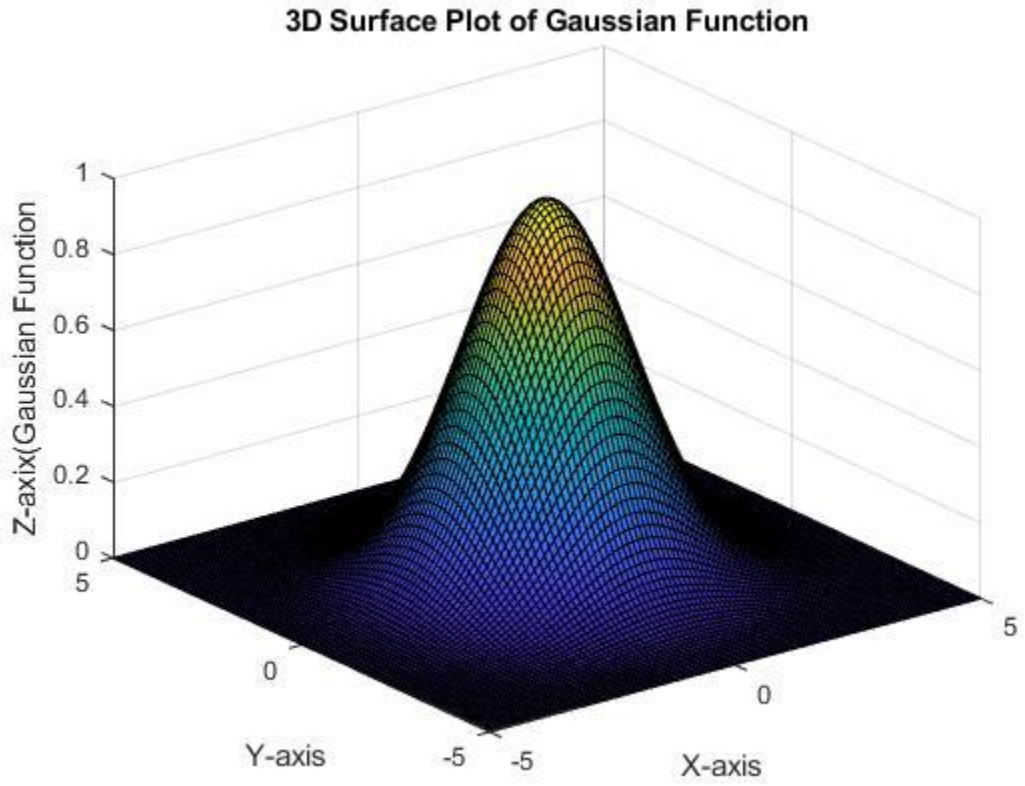
04.

```
x = 0:0.5:10;
y1 = exp(-x);

subplot(2,2,1);
plot(x,y1,'-b','LineWidth',1.5)
xlabel('x')
ylabel('y')
title('Normal Plot:y=e^-^x')
grid on

subplot(2,2,2);
semilogy(x,y1,'-g','LineWidth',1.5)
xlabel('x')
ylabel('y(log Scale)')
title('Semilog y Plot:y=e^-^x')
grid on

subplot(2,2,3);
semilogx(x,y1,'-r','LineWidth',1.5)
xlabel('x(log Scale)')
ylabel('y')
title('Semilog x Plot:y=e^-^x')
grid on

subplot(2,2,4);
loglog(x,y1,'-k','LineWidth',1.5)
xlabel('x(log Scale)')
ylabel('y(log Scale)')
title('Loglog Plot:y=e^-^x')
grid on
```



05.

```
x = linspace(-5, 5, 100);
y = linspace(-5, 5, 100);
[X, Y] = meshgrid(x, y);
Z = exp(-(X.^2/4 + Y.^2/4));

figure;
surf(X, Y, Z);

xlabel('X-axis');
ylabel('Y-axis');
zlabel('Z-axix(Gaussian Function');
title('3D Surface Plot of Gaussian Function');
grid on;

xlim([-5 5]);
ylim([-5 5]);
zlim([0 1]);
```



06.

```
x = -10:0.1:10;
x1 = x(x < -3);
y1 = x1 + 6;
x2 = x(x >= -3 & x <= 3);
y2 = 3 * ones(size(x2));
x3 = x(x > 3);
y3 = x3;
figure;
plot(x1, y1, '-b', 'LineWidth', 1.5); hold on;
plot(x2, y2, '--g', 'LineWidth', 1.5);
plot(x3, y3, '-r', 'LineWidth', 1.5);

grid on;
xlabel('x');
ylabel('y');
title('Piecewise Function');

legend('y = x + 6 ', 'y = 3 ', 'y = x ');
```