```
% MECH 6318 - HW 1
% Jonas Wagner
% 2021-09-07

% Problem 2.10 ------------------------------------------
A =[1, 0, 2;
    0, 3, 4;
    2, 1, 3]
```

```
A = 3×3
     1     0     2
     0     3     4
     2     1     3
```

```
B =[0, 2, 4;
    2, 3, 4;
    5, 1, 3]
```

```
B = 3×3
     0     2     4
     2     3     4
     5     1     3
```

```
% Part a
A'
```

```
ans = 3×3
     1     0     2
     0     3     1
     2     4     3
```

```
% Part b
(A')'
```

```
ans = 3×3
     1     0     2
     0     3     4
     2     1     3
```

```
% Part c
(A + B)'
```

```
ans = 3×3
     1     2     7
     2     6     2
     6     8     6
```

```
% Part d
A' + B'
```

```
ans = 3×3
     1     2     7
     2     6     2
     6     8     6
```

```
% Problem 2. 14 ----------------------------------------
I = eye(3)
```

```
I = 3×3
     1     0     0
     0     1     0
     0     0     1
```

```
I'
```

```
ans = 3×3
     1     0     0
     0     1     0
     0     0     1
```

```
% Problem 2.16 ----------------------------------------
% by hand calc
Delta = [1, -6, 5, -1]
```

```
Delta = 1×4
     1    -6     5    -1
```

```
roots(Delta)
```

```
ans = 3×1
    5.0489
    0.6431
    0.3080
```

```
% with MATLAB
A =[3, 2, 1;
    2, 2, 1;
    1, 1, 1]
```

```
A = 3×3
     3     2     1
     2     2     1
     1     1     1
```

```
poly(A)
```

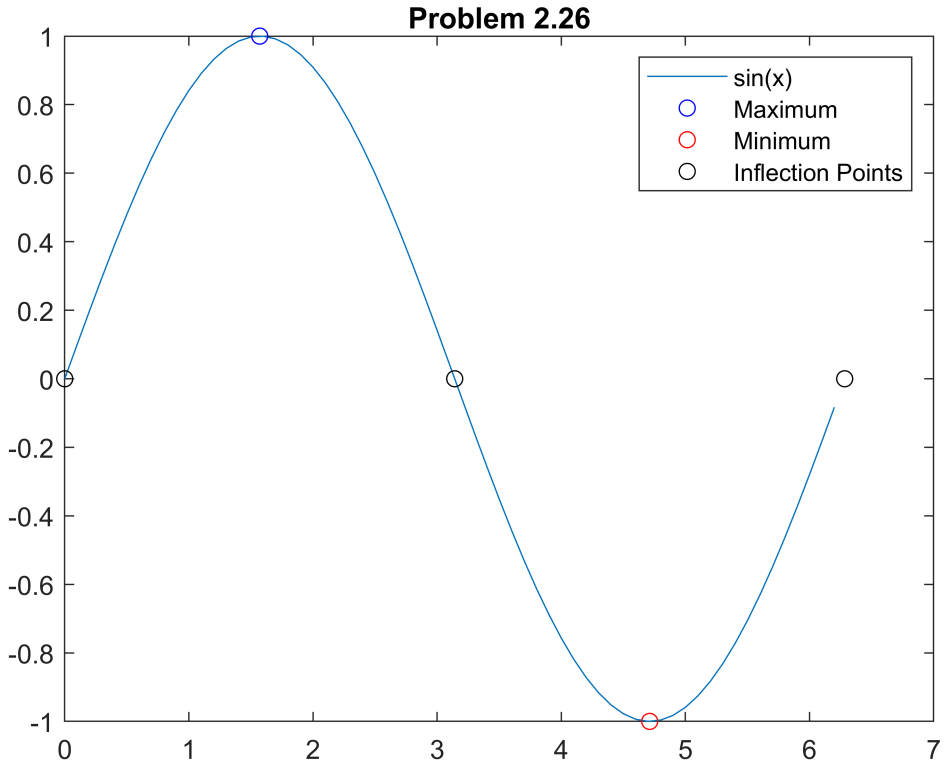
```
ans = 1×4
    1.0000   -6.0000    5.0000   -1.0000
```

```
eig(A)
```

```
ans = 3×1
    0.3080
    0.6431
    5.0489
```

```
% Problem 2.26 ------------------------------------------
x = 0:0.1:2*pi;
sinx = sin(x);

% Part d
figure()
plot(x,sinx,'DisplayName','sin(x)')
hold on
scatter([pi/2], [1], 'b', 'DisplayName', 'Maximum')
scatter([3*pi/2],[-1],'r','DisplayName','Minimum')
scatter([0, pi,2*pi], [0,0,0], 'k', 'DisplayName',...
    'Inflection Points')
legend
title('Problem 2.26')
```




```
% Problem 2.27 ------------------------------------------
x = -2:0.1:2;
fa1 = exp(-1*x.^2);
fa2 = exp(-2*x.^2);
fa3 = exp(-3*x.^2);

figure()
hold on
plot(x,fa1,'DisplayName','a=1')
plot(x,fa2,'DisplayName','a=2')
plot(x,fa3,'DisplayName','a=3')
```

```
legend
title('Problem 2.27')
```