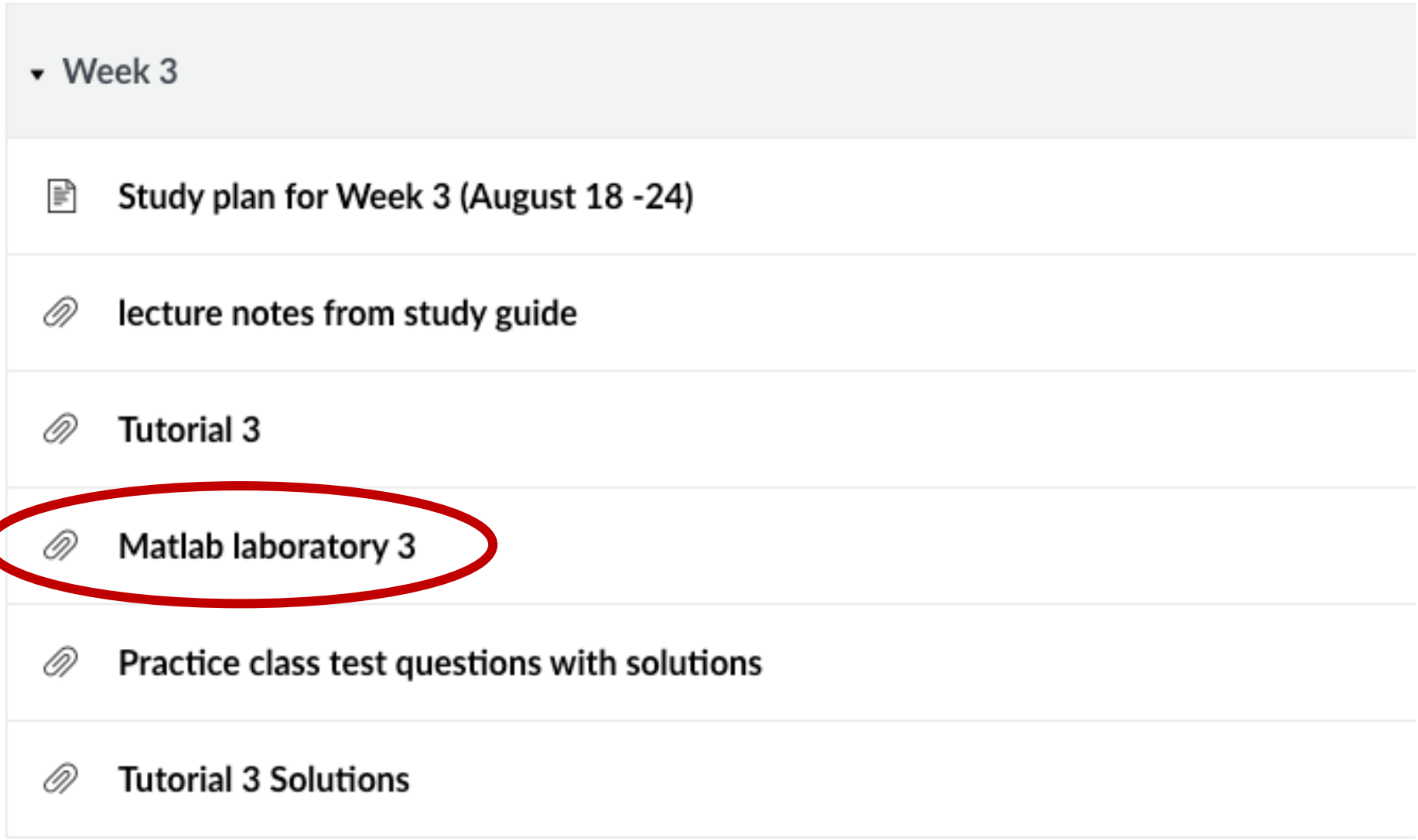
# Plan for Week 3 Computer Lab

- Please run through the "**MATLAB Lab 3**" document
- We'll learn how to use MATLAB to **diagonalize a matrix** and how this relates to analyzing **quadratic curves** and identifying their principal axes
- We'll learn how to use MATLAB to **plot functions**
- Note: the next assessment is a graded quiz due on **Friday Week 4**. *It's timed, so don't start this until you have covered the content and have 1 hour spare.*

# Lab 3 instructions



# By the end of today ensure you can …

Find eigenvectors and eigenvalues of a matrix

```
>> A = [-0.382 3.80428/2;
3.80428/2 -1.618];
>> [M,D] = eig(A);
```

Diagonalisation of a matrix

```
>> inv(M)*A*M
```

(can use transpose(M) if A is symmetric)

```
>> D
```

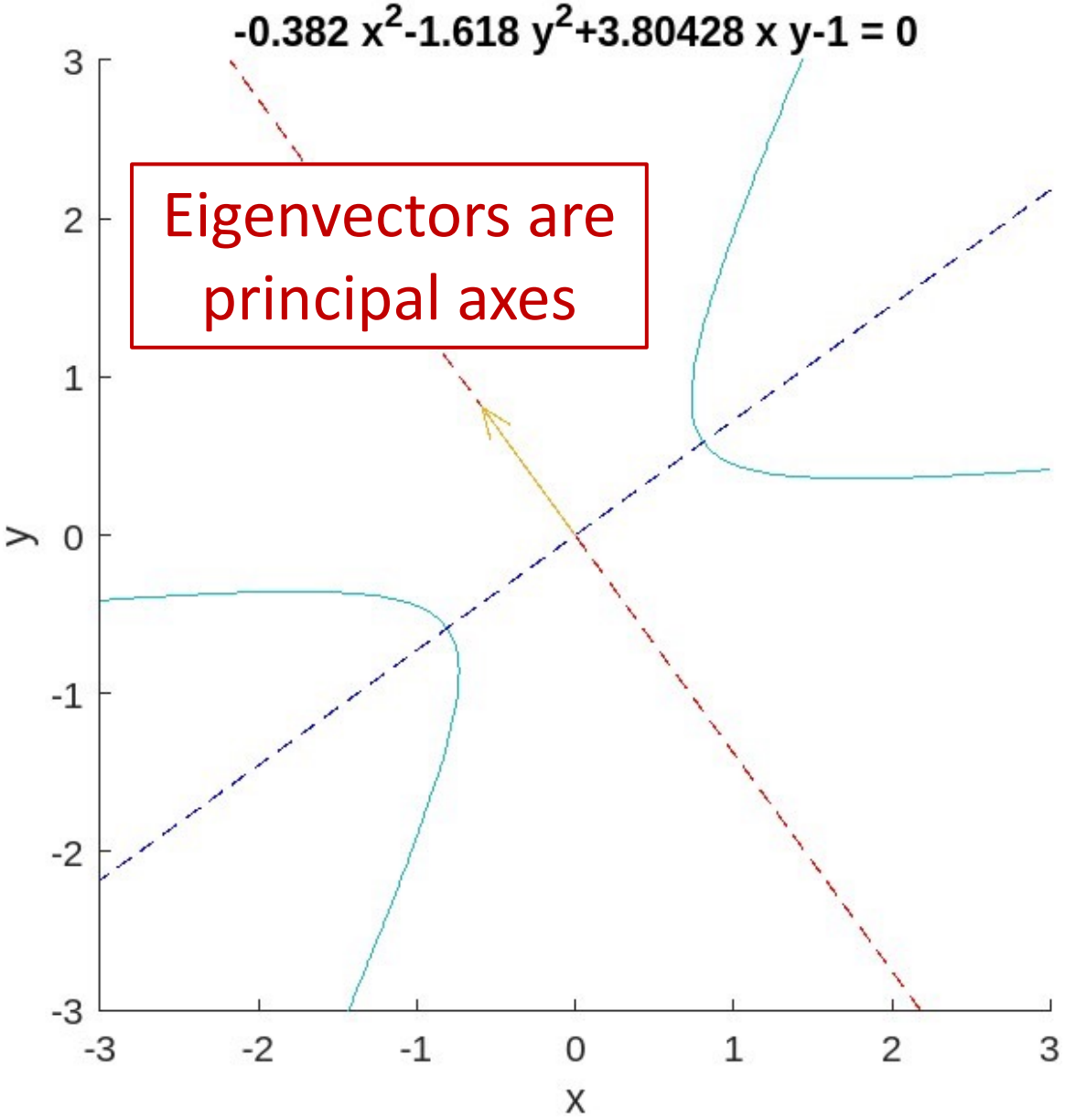
Check if eigenvectors are orthogonal

```
>> transpose(M(:,1))*M(:,2)
```

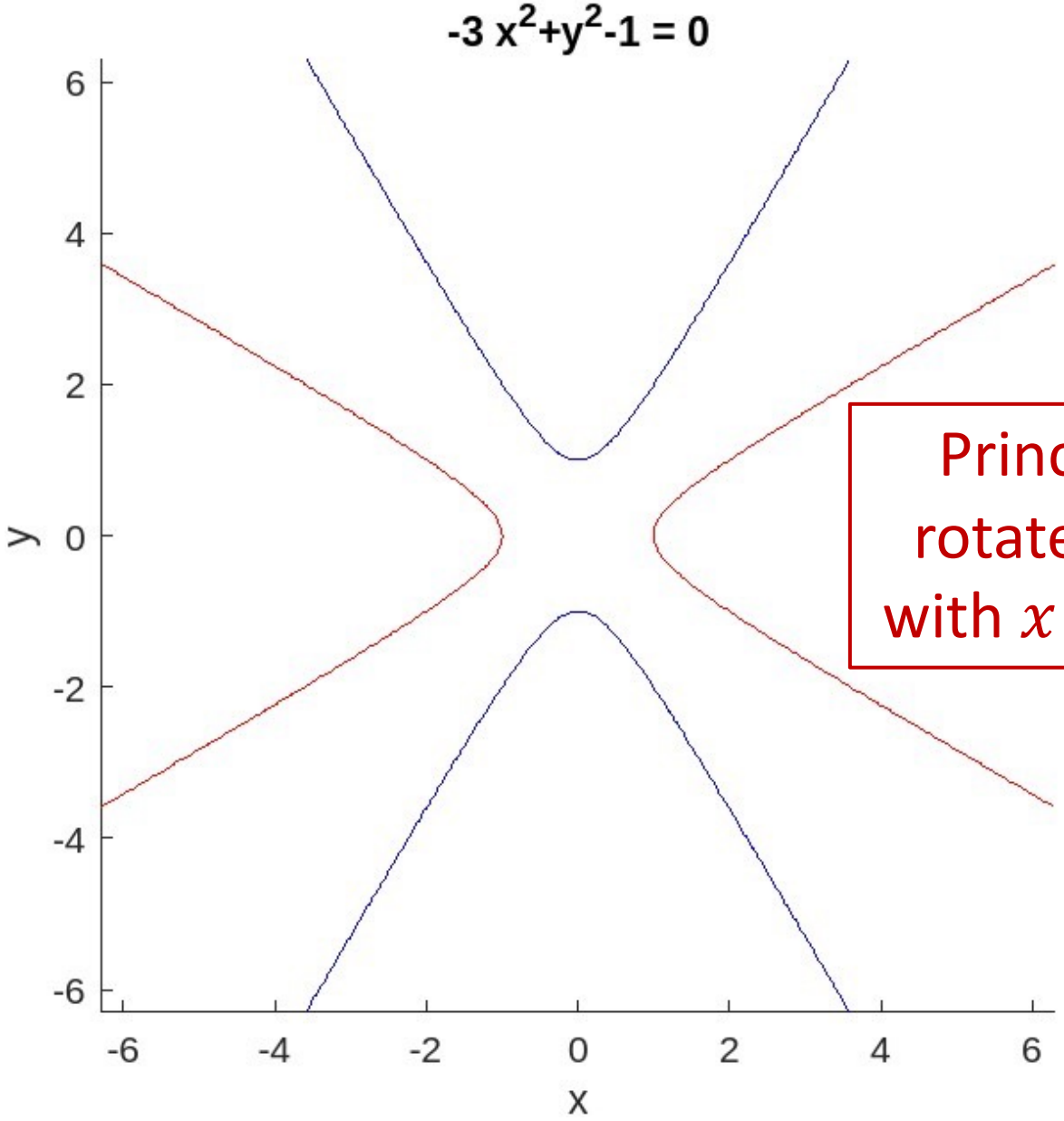
Plot a quadratic curve

```
>> ezplot('-0.382*x^2-
1.618*y^2+3.80428*x*y-1')
```

# Plots for Lab 3



# Plots for Lab 3




Principal axes rotated to align with $x$ and $y$ axes