Matlab notes for Math 210 Homework 6

Print your matrix:

```
A=toeplitz([1 2 3 zeros(1,5)])
```

```
A = 8×8
     1     2     3     0     0     0     0     0
     2     1     2     3     0     0     0     0
     3     2     1     2     3     0     0     0
     0     3     2     1     2     3     0     0
     0     0     3     2     1     2     3     0
     0     0     0     3     2     1     2     3
     0     0     0     0     3     2     1     2
     0     0     0     0     0     3     2     1
```

```
[V,D]=eig(A)
```

```
V = 8×8
    0.3210   -0.0075   -0.5411    0.1324   -0.5782   -0.1993    0.4092   -0.2125
   -0.1558    0.4153    0.1629   -0.6097   -0.1155    0.3714    0.4039   -0.3010
   -0.4749   -0.2644    0.4181    0.3291   -0.0392   -0.3162    0.3940   -0.4057
    0.3836   -0.5075   -0.0765    0.0490    0.3884    0.4716    0.1191   -0.4468
    0.3836    0.5075    0.0765    0.0490    0.3884   -0.4716   -0.1191   -0.4468
   -0.4749    0.2644   -0.4181    0.3291   -0.0392    0.3162   -0.3940   -0.4057
   -0.1558   -0.4153   -0.1629   -0.6097   -0.1155   -0.3714   -0.4039   -0.3010
    0.3210    0.0075    0.5411    0.1324   -0.5782    0.1993   -0.4092   -0.2125
D = 8×8
   -4.4096         0         0         0         0         0         0         0
         0   -3.9758         0         0         0         0         0         0
         0         0   -1.9202         0         0         0         0         0
         0         0         0   -0.7546         0         0         0         0
         0         0         0         0    1.6030         0         0         0
         0         0         0         0         0    2.0332         0         0
         0         0         0         0         0         0    5.8628         0
         0         0         0         0         0         0         0    9.5612
```

The columns of V are the eigenvectors corresponding to the eigenvalues in the diagonal of D.

```
trace(A)
```

```
ans = 8
```

```
trace(D)
```

```
ans = 8.0000
```

```
det(A)
```

```
ans = 4.6410e+03
```

```
det(D)
```

```
ans = 4.6410e+03
```

```

```

The eigenvalues are estimates, so the determinant and trace of D have a very small error.