

- Lemma 4.3: We show that if  $A$  is diagonal we can order the elements in any way.

```
In[1]:= dMat = DiagonalMatrix[{d1, d2, d3}];
```

- Exchange d2 and d3

```
In[2]:= perm = {  
    {1, 0, 0},  
    {0, 0, 1},  
    {0, -1, 0}  
};
```

```
In[3]:= perm.dMat.Transpose[perm] // MatrixForm
```

Out[3]/MatrixForm=

$$\begin{pmatrix} d1 & 0 & 0 \\ 0 & d3 & 0 \\ 0 & 0 & d2 \end{pmatrix}$$

```
In[4]:= Det[perm]
```

Out[4]= 1

- Exchange d1 and d2

```
In[5]:= perm = {  
    {0, 1, 0},  
    {-1, 0, 0},  
    {0, 0, 1}  
};
```

```
In[6]:= perm.dMat.Transpose[perm] // MatrixForm
```

Out[6]/MatrixForm=

$$\begin{pmatrix} d2 & 0 & 0 \\ 0 & d1 & 0 \\ 0 & 0 & d3 \end{pmatrix}$$

```
In[7]:= Det[perm]
```

Out[7]= 1