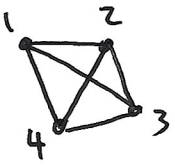
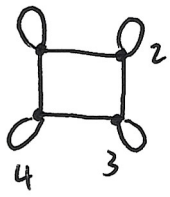
Quin Boob
HW 17

Ok to post

1) 

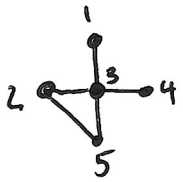
$$\begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{bmatrix}$$

Its not possible because all points have an odd degree ~~number of edges~~



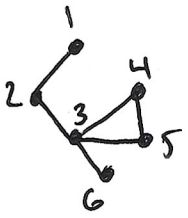
$$\begin{bmatrix} 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \end{bmatrix}$$

Its not possible because all points have odd degree

2) 

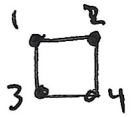
$$\begin{bmatrix} 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 0 \end{bmatrix}$$

This has a Eulerian path because all but 2 vertices have even degree



$$\begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

This has a Eulerian path because all but 2 vertices have even degrees

3) 

$$\begin{bmatrix} 0 & 1 & 1 & 0 \\ 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}$$

This is a Eulerian cylce because all vertices have even degree

$$\begin{bmatrix} 0 & 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 0 \end{bmatrix}$$

This is a Eulerian cycle b/c all vertices have even degree

4) For there to be a Eulerian cycle all veltices must have even degree, this is because Everytime somthing enters a vertice it must be able to exit, this means that the edges must be in pairs (2n) $\Rightarrow$ Degree = 2n at every point.

5) For there to be a Eulerian Path all but 2 vertices must have even degrees. This is because all but the start and end vertices must have an "entrance" and an "Exit" so the must come in pairs (2n). The start vertice must only be able to exit so it does not need its edges to come in pairs, infact it cannot have 2n edges. By a similiar logic, ~~it can~~ the end vertice only needs an entrance so it cant have 2n edges attached