3. Assume by way of contradiction that $K_{3,3}$ is planar. Then the graph satisfies Euler's thm

$$v - e + f = 2.$$ Since $|V(K_{3,3})| = 6$ and $|E(K_{3,3})| = 9$

$$6 - 9 + f = 2$$
$$f = 5$$

and $K_{3,3}$ has 5 faces.

Observe that a face of $K_{3,3}$ corresponds to a cycle and since the minimum cycle length in $K_{3,3}$ is 4, and ~~each~~ the number of edges per face is counted (possibly) twice, we have that

$$4f \leq 2e.$$

But then $$4(5) \leq 2(9)$$

$$20 \leq 18 \quad \text{which is a}$$

Contradiction. $\square$