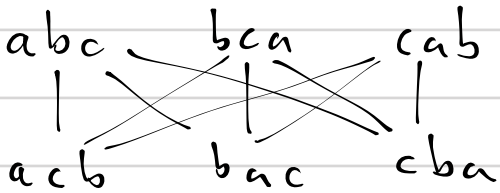
1

1. $|V| = 3! = 6$

$d(v) = \binom{3}{2} = 3, \ \forall v \in V \Rightarrow G$ regular.

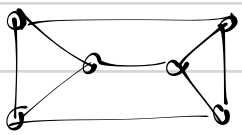
$$|E| = \frac{1}{2}\sum_{v \in V} d(v) = \frac{3 \cdot 6}{2} = 9$$

2. G can be depicted as



which is isomorphic to a $K_{3,3}$. $\Rightarrow G$ is not planar.

3. G is bipartite. Using only two colors, there are EXACTLY two ways to proper color it: The upper split uses the first color and the lower uses the second, or vice versa.

4.  is not bipartite.

2 1. This is a partition of a set of 29 elements (the postcards) into 3 groups of 5 and 7 groups of 2. The groups are the envelopes, as they can only be told apart by their content.

2. $$\frac{29!}{(5!)^3 \cdot 3! \, (2!)^7 \cdot 7!}$$