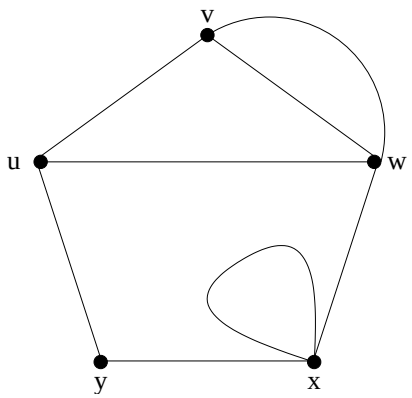
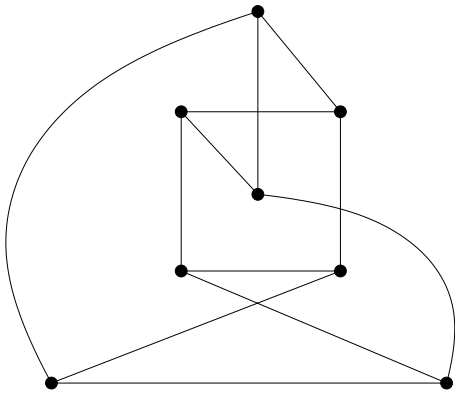
VanWyk's 103 **Section 6.1 Homework Problems**

1. Give 3 real-life situations that can be represented by graphs.
2. Sketch the following graphs:
   (a) C_6
   (b) K_6
   (c) $K_{3,4}$
3. Find the degree of each of the vertices of Γ below. Is Γ a simple graph?



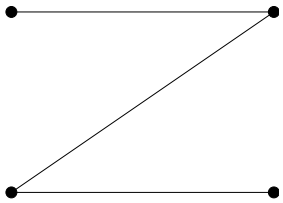
4. Is the graph Γ below planar?



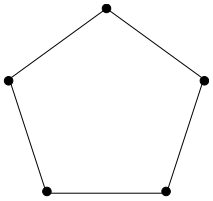
5. If Γ is a simple graph, then its *complement* $\overline{\Gamma}$ has the same vertices as Γ, and 2 vertices are adjacent in $\overline{\Gamma}$ if and only if they are **not** adjacent in Γ. (So $\overline{\Gamma}$ contains all the edges in the complete graph that are not edges of Γ.)

   Find the complements of the following graphs:

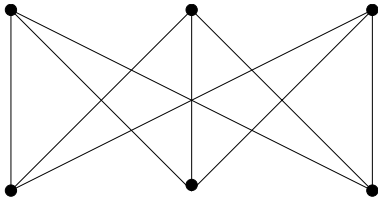
   (a)



   (b)

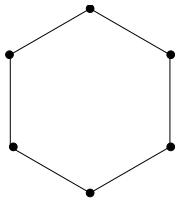


   (c)

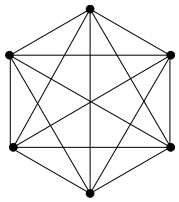


1. Computer networks (vertices are computers, edges are connections), airline flight networks (vertices are cities, edges are flight paths), "introduction graphs" (vertices are people, there is an edge between two people if they have met each other), etc.

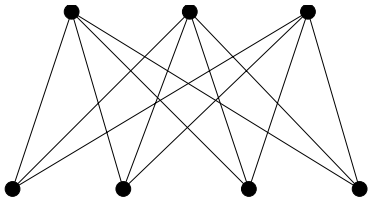
2a.



2b.



2c.

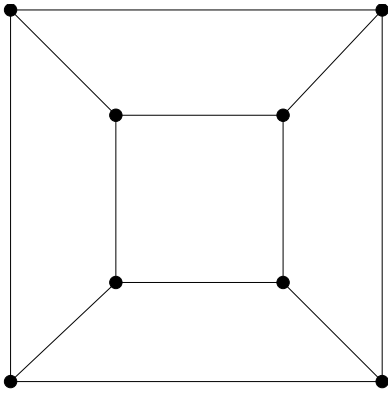


3. The degrees are

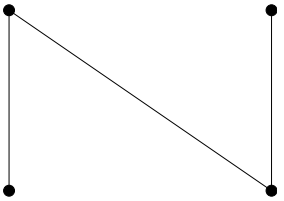
vertex	u	v	w	x	y
degree	3	3	4	4	2

Γ is not a simple graph. It has a loop and multiple edges.

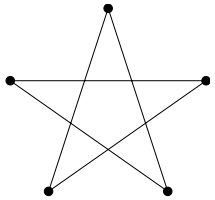
4. Yes. It can be redrawn as:



5a.



5b.



5c.