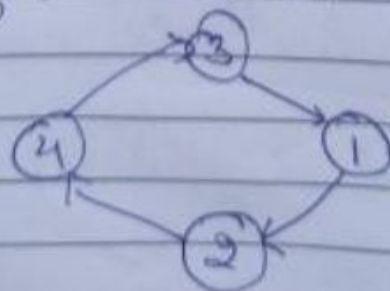


### Assignment 3

Q Write the answer for the foll. ques  
Explain

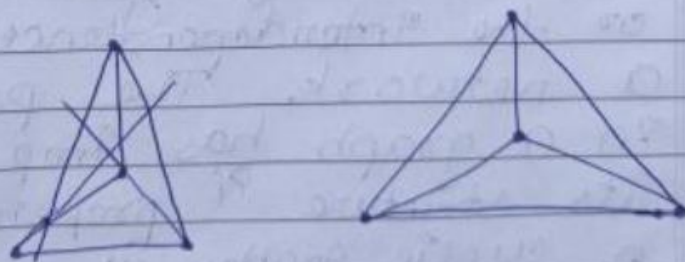
a) Directed Graph

A directed graph, also known as a directed network or a directed multigraph, is a graph data structure consisting of a finite set of vertices and edges, where each edge has a direction & goes from one vertex to another. The direction of the edge shows the relationship b/w the vertices, with the "from" vertex being origin & "to" vertex being the destination. In a directed graph, it is possible to traverse graph from one vertex to another along the directed edges, but it may not be possible to traverse the graph in the opp. direc<sup>n</sup>. Directed graphs are commonly used to represent relationships or connections b/w entities such as in computer networks, transportation systems, or social networks.



## c) Planar graph

A planar graph is a graph that can be drawn on a plane such that no edges intersect. This means that all vertices and edges are represented by simple closed curves, and no two edges cross. In other words, a planar graph can be embedded in the plane without any overlapping edges. Planar graphs are commonly used to represent geometric relationships b/w objects, such as cities & roads in a map, or electrical circuits in an electronic design. They have several imp properties including a max. degree of five for a graph without any loops or multiple edges. The study of planar graphs is an imp area of graph theory and has numerous applications in computer science, engineering & other fields.





## b) Cyclic Graph

A cyclic graph is a graph that contains at least one cycle, which is a closed path that starts and ends at the same vertex, passing through other vertices and edges along the way. In a cyclic graph, it is possible to traverse the graph in a circular manner, visiting the same vertex more than once. Cycles can be of different lengths, from a three-vertex cycle to a much larger cycle that passes through many vertices.

Cyclic graphs are commonly used to represent relationships between objects or events, where the cycle represents a repeating pattern or a feedback loop. For eg, cyclic graphs can be used to represent seasonal changes, the behaviour of systems with feedback, or the interdependence of processes in a network. The presence of cycles in a graph has imp. implications for its structure & properties, & the study of cyclic graphs is a central area of graph theory.

