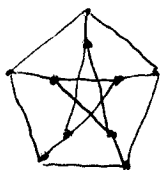
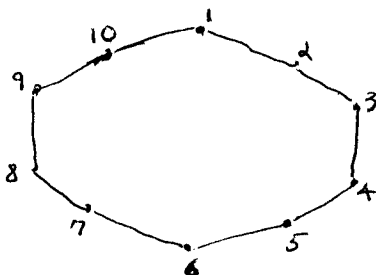


- ① WE WILL SHOW THAT THE PETERSEN GRAPH DOES NOT HAVE A HAMILTON CYCLE, USING THE FACT THAT IT DOES NOT HAVE A 3-CYCLE OR 4-CYCLE:



(SEE CH. 11, #12)

PF ASSUME INSTEAD THAT IT HAS A HAMILTON CYCLE; SINCE THERE ARE 10 VERTICES, WE CAN REPRESENT IT LIKE THIS:



NOW WE HAVE 5 MORE EDGES TO INSERT.

- A) EXPLAIN WHY THESE EDGES MUST PAIR UP THE VERTICES,
- B) EXPLAIN WHY WE CANNOT HAVE EVERY VERTEX JOINED TO THE OPPOSITE VERTEX.
- C) SHOW THAT IF NOT EVERY VERTEX IS JOINED TO THE OPPOSITE VERTEX, THEN SOME VERTEX IS JOINED TO A VERTEX 4 PLACES AWAY.  
(WE CAN ASSUME, WITHOUT LOSS OF GENERALITY, THAT 1 IS JOINED TO 5.)
- D) SHOW THAT 10 CANNOT BE JOINED TO ANY VERTEX.