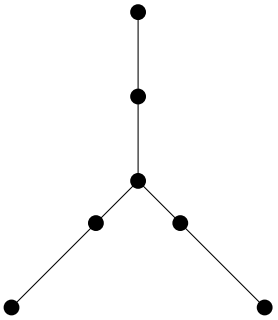
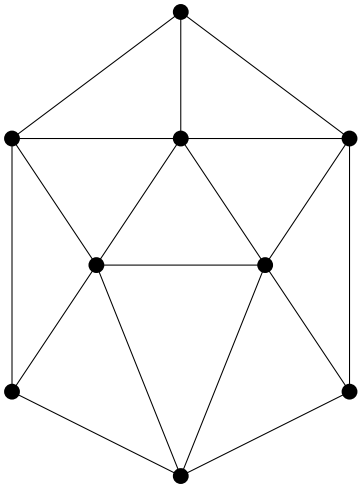
13. Practice sheet for the lecture: **Felsner, Heldt**
Vorlesung über Graphentheorie/ Graphtheory (DS II) 19. January
`http://page.math.tu-berlin.de/~felsner/Lehre/dsII11.html`

(1) Prove that one of the graphs below is a circle graph but not a circular-arc graph and prove that the other is a circular-arc graph but not a circle graph.





(2) Suppose that the graph G can be split up into to graphs G_1 and G_2 such that $G = G_1 \cup G_2$, G_2 and G_2 are perfect, and $G_1 \cap G_2$ is a clique. Prove that G is perfect.

(3) Let Q be a maximum clique in a connected chordal graph G with at least three vertices. For all vertices x of G prove, that there are two vertices $y_1, y_2 \in Q$, such that the length of the shortest path from x to y_1 is different from the length of the shortest path from x to y_2.

(4) Prepare to give a four minute presentation about the polytope based proof of the Perfect Graph Theorem (The presentation may be a summary; a sketch of the proof; a collection of key ideas; ... ; it should make sense for an uninformed audience).

(5) *Please hand in your solution of this exercise:*

   (a) Determine all trees, which are split graphs.

   (b) Find two split graphs with the same degree sequence, which are non-isomorphic.