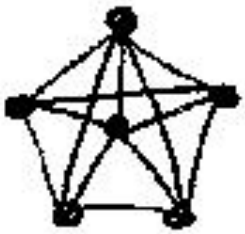
TW 314 (Toegepaste Diskrete Wiskunde)

Tutoriaal 5: 2 Maart 2017

---

1. Teken alle bome van orde ses.
2. Die grade van die punte van 'n boom T van orde 13 is 1, 2 en 5. As T presies drie punte van graad 2 het, hoeveel blare het dit.
3. Bepaal of die volgende grafieke planêr is of nie. Motiveer jou antwoorde volledig.

G



H

4. Vind 'n planêre grafiek wat geen punt van graad minder as vyf bevat nie.
5. Bewys waar of vals: Elke planêre grafiek het 'n punt van graad hoogstens vyf.
6. Bewys dat elke planêre grafiek met minder as twaalf punte 'n punt van graad hoogstens vier het.
7. Toon aan dat daar 'n d-reguliere maksimaal planêre grafiek is vir $d = 2, 3, 4$ en 5.
8. Vind alle 4-reguliere maksimaal planêre grafieke.

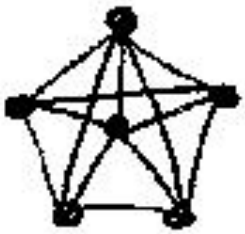
TW 314 (Applied Discrete Mathematics)

Tutorial 5: 2 March 2017

---

1. Draw all trees of order six.
2. The degrees of the vertices of a tree T of order 13 are 1, 2 and 5. If T has exactly three vertices of degree 2, how many leaves does it have.
3. Determine whether the following graphs are planar or not. Fully motivate your answers.

G



H

4. Find a planar graph that contains no vertex of degree less than five.
5. Prove or disprove: Every planar graph has a vertex of degree at most five.
6. Prove that every planar graph with fewer than 12 vertices has a vertex of degree at most four.
7. Show that there is a d-regular maximal planar graph for $d = 2, 3, 4$ and 5.
8. Find all 4-regular maximal planar graphs.
