MAT 2348 — exercises #9

We consider the directed graph $G = (V, E)$ with

$V = \{1, 2, 3, 4, 5, 6\}$

$E = \{(1,1), (1,3), (3,3), (3,1), (2,6), (2,4), (4,2), (4,5), (5,6), (6,1)\}$

A Walks, trails, paths

1. Draw the graphical representation of G.

2. Give a walk (that is not a trail), a trail (that is not a path) and a path from 1 to 3.

3. How many walks from 2 to 6 are there? How many paths?

B Counting and complete graphs

A (directed) graph (V, E) is complete when E contains all possible edges relating vertices in V.

1. Draw complete directed and undirected graphs with 2, 3, 4, 5 vertices.

2. How many edges a complete undirected/directed graph with n vertices has?

3. Are there any subgraphs of G that are complete?

C Isomorphisms

1. If we replace $(1,1)$ by $(1,4)$, is the graph we obtain isomorphic to G?

2. Show that two complete directed/undirected graphs with the same number of vertices are isomorphic.

Grimaldi's exercises 11.1: 2, 3, 6, 7, 9, 15.
Grimaldi's exercises 11.2: 1, 8, 9, 10, 12.