Graph isomorphisms
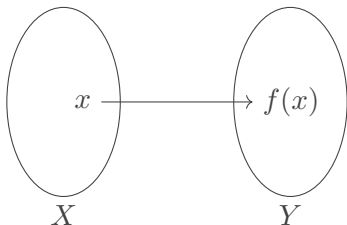
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Functions

Definition

Suppose that X and Y are sets. We say we have a function f from X to Y if for each x in X we can specify a unique element in Y, which we denote by $f(x)$.
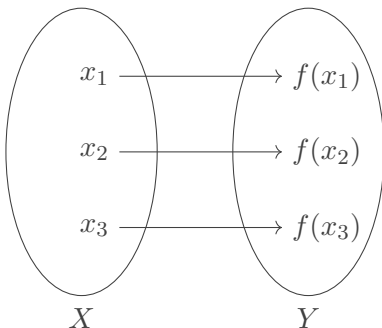
Bijections

Definition

A bijection is function f from a set X to a set Y where both of
the following are true:
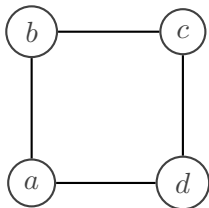
– every y in Y is a value $f(x)$ for at most one x in X.

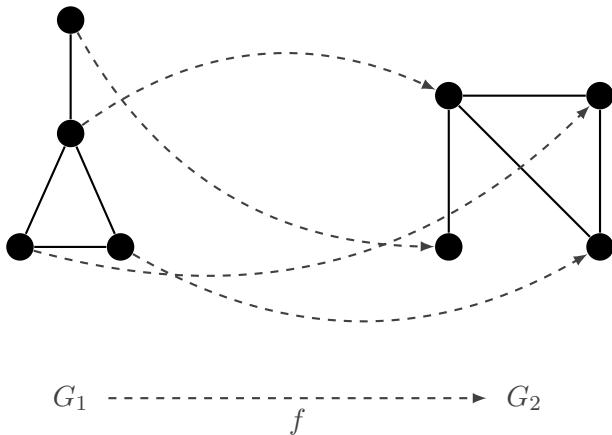– every y in Y is a value $f(x)$ for at least one x in X.

Isomorphism

Definition

Two graphs G_1 and G_2 are said to be isomorphic when there is a bijection α for the vertex set V_1 of G_1 to the vertex set V_2 of G_2 such that $\{\alpha(x), \alpha(y)\}$ is an edge of G_2 if and only if (x, y) is an edge of G_1.
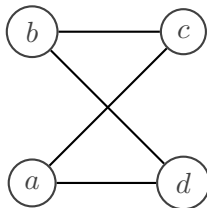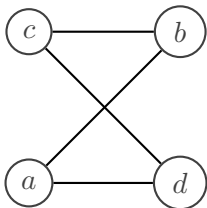
Isomorphism example

Isomorphism: degrees

Exercise

Determine if these two graphs are isomorphic.