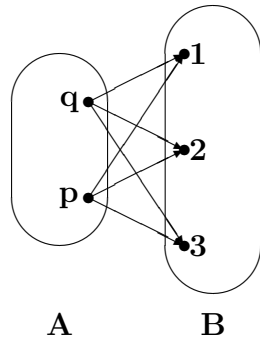
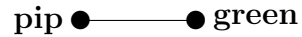


Math 3131 Prof. Pennance – Summary of Lecture 3 - Relations

1. Unordered sets  $\{a, b\}$
2. Ordered pairs  $(a, b)$ .
3. A triple  $(A, B, R)$  is called *relation* or *table* if
  - (a)  $A$  is a set.
  - (b)  $B$  is a set.
  - (c)  $R$  is a set of ordered pairs such that every ordered pair  $(a, b)$  in  $R$  has its tail  $a$  in  $A$  and its head  $b$  in  $B$
4. The genus of *relation* is triple.
5. Drawings of relations.
6. The *table* of a relation.
7. If  $(A, B, R)$  is a relation, we will call elements of  $A$  and  $B$  *vertices* and the ordered pairs in  $R$  *edges*.
8. *Complete* relations. A relation  $(A, B, R)$  is complete if  $R$  contains **all** ordered pairs  $(a, b)$  with  $a \in A$  and  $b \in B$ .



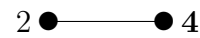
9. The *cartesian product* of sets  $A$  and  $B$  is the set of **all** directed edges  $(a, b)$  with  $a \in A$  and  $b \in B$ . It is denoted  $A \times B$ .
10. Edges represent verbal associations.
  - (a) The PIP party is green.



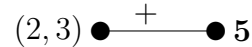
- (b)  $2 \times 3$  is 6.



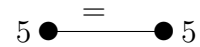
- (c) The square of 2 is 4.



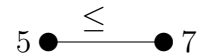
- (d)  $2 + 3$  is 5.



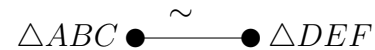
- (e) 5 equals 5



- (f) 5 is less than 7.



- (g) Triangle  $ABC$  is similar to triangle  $DEF$



11. The relations of *incidency* and *adjacency* in geometry and graph theory.
12. Definition of the *degree* of a vertex in a graph.