

Tutorial 7 – Venn diagrams

Exercise 1:

For the following arguments, decide whether they are valid or invalid using Venn diagrams method.

- a) All computers have a processor.
Everything that has a processor needs electricity.

All computers need electricity.

- b) Every computer is a machine.
Every computer has a processor.

Some machines have a processor.

- c) Some programs are cheated by students.
All Java projects are programs.

Some projects are cheated.

- d) The student pass a logic course if he learns.
Some students do not learn.

Some students do not pass a logic pass.

- e) The student pass a logic course if he learns.
Student Karel is learning.

Karel is going pass a logic course.

- f) Students who are not on the list will receive a penalty.
Student Karel is on the list.

Karel will not receive a penalty.

- g) The student pass a logic course if he learns.
Student Karel is not learning.

Karel does not pass a logic course.

- h) All elephants are intelligent.
No fish is intelligent.
Some fish are elephants.

Some elephants are not fish.

- i) No even number is odd.
Some odd numbers are prime numbers.

Some prime numbers are not even.

- j) All numbers divisible by 4 or 6 are even.
Some numbers divisible by 6 are divisible by 4.

It is not true that no even number is divisible by 6.

- k) No one who is sick and very tired goes to work.
Some very tired people go to work.

There are also very tired people who are not sick.

- l) No workers are sick nor very tired.
Some very tired people are sick.

Some sick people are not working.

- m) Every even number is natural or odd.
Every odd number is a natural number.

No odd number is even.

- n) All dogs are mammals, but they cannot fly.
Some mammals are not dogs.

Some mammals can fly

- o) No one with a red nose can be prime minister.
All Wallachians have red noses.

Therefore, no Wallachian can be prime minister.

- p) Some footballers are not intelligent.
All footballers are athletes.

Some athletes are not intelligent.

- q) All dogs bite.
Alík is not a dog.

Alík does not bite.

- r) They are all generous or greedy.
No one greedy is generous.
Some students are not greedy.

Some students are generous.

- s) No one with purple hair is young.
Some with purple hair drink milk.

Some who drink milk are not young.

- t) Some who like Alice don't like Robert.
Robert likes Alice.

Who likes Robert doesn't like Alice.