

## 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 or very tired.  
Some very tired people are sick.

\_\_\_\_\_ —  
Some patients 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.

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Some who drink milk are not young.  
item Some who like Alice don't like Robert.  
Robert likes Alice.

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Who likes Robert doesn't like Alice.