Using Euler Diagrams to Verify Syllogisms   (Section 2.6)

The objectives for this section include:

1. Use Euler diagrams to identify a valid syllogism.
2. Use an Euler diagram to diagram to identify an invalid syllogism.

A **syllogism** consists of a set of statements called premises followed by a conclusion that may contain quantifiers such as _____.

A syllogism is valid whenever all the premises are true, and the conclusion is also true. If the conclusion of a syllogism can be false even though all the premises are true, then the syllogism is invalid. An Euler diagram is similar to a Venn diagram, an Euler diagram represents quantifiers such as *all*, *some*, and *none* rather than union or intersection. Rather than using truth tables a syllogism can be _____ to determine its validity.

Class Practice 1 – Use an Euler diagram to determine the validity of the syllogism.

All original parts are under warranty.

This part is under warranty.
- -
∴ **This part is an original part.**

Complete **Quiz Yourself** (**16**) on p. 124

Note: SOME can be one or more which includes all

Class Practice 2 – Is the syllogism valid (try three different Euler diagrams)?

Some mammals are large

Some dangerous animals are large.

∴ Some mammals are dangerous.

Class Practice 3 A pair of statements is said to be consistent if they can be simultaneously true, otherwise they are inconsistent. Use Euler diagrams to determine whether each pair is consistent.
Show your work and state your results.

Some dogs are not barkers.
All barkers are dogs.

Write the negation of the following in <u>two</u> ways:

Some students missed class on Friday.

Indiviually complete the following and check with Professor Harms when you are done.

In each use Euler diagram to determine whether the given syllogism is valid or invalid. Clearly state your results.

     a)   All horses have four legs.
              Thunder is a horse.   .
              Therefore, Thunder has four legs.

     b)   All horses have four legs.
              Thunder is not a horse.   .
              Therefore, Thunder does not have four legs.

     c)   All horses have four legs.
              Some animals with four legs are black.
              Therefore, some horses are black.

     d)   All A 's are B's.
              Some C's are B's.   .
              Therefore, some C's are not A's.

Assignment for Monday 2/22:

Read pp. 123-128
Complete #4, 7, 9, 11, 13, 14, 17, 21, 22, 25, 26, and 27 on pp. 128-129
& Chapter Test #5 - 20 on pp. 135-136