

3.6 Euler Diagrams and Syllogistic Arguments

Math 120
Math for General Education
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Symbolic Arguments vs. Syllogistic Arguments

| | Words or phrases used | Method of determining validity |
|-----------------------------|---|--|
| Symbolic argument | And, or, not, if-then, if and only if | Truth tables or by comparison with standard forms of arguments |
| Syllogistic argument | All are, some are, none are, some are not | Euler Diagrams |

Euler Diagrams

Determine whether the following syllogism is valid or invalid:

All keys are made of brass.

All things made of brass are valuable

Therefore, all keys are valuable.

Construct an Euler diagram.

1. Set of all keys
2. All things made of brass
3. All valuable things

Conclusion: "All keys are valuable" is valid

Euler Diagrams (cont.)

#24. All pilots can fly.

All astronauts can fly.

Therefore, some pilots are astronauts.

Construct Euler Diagram

1. All pilots can fly is a subset of all people that fly.
2. All astronauts can fly is also a subset of all people that can fly.

=> Argument is not valid.

Practice Problems

◆ In Class

- Pages 167 – 168
- #12, 14, 26

◆ Practice Problems

- Pages 167 – 168
- #1-30