

In a certain land, all Arogs are Brafs, all Crups are Brafs, all Dramps are Arogs, and all Crups are Dramps. Which of the following statements is implied by these facts?

- (A) All Dramps are Brafs and are Crups.
- (B) All Brafs are Crups and are Dramps.
- (C) All Arogs are Crups and are Dramps.
- (D) All Crups are Arogs and are Brafs.
- (E) All Arogs are Dramps and some Arogs may not be Crups.

2007 AMC 10 B, Problem #5—

“Use A , B , C , and D represent the following statements about a person in the land.”

Solution

Answer (D): Let A , B , C , and D represent the following statements about a person in the land.

A : Is an Arog. B : Is a Braf. C : Is a Crup. D : Is a Dramp.

Then the statement in the first sentence of the problem can be expressed as:

$$A \implies B, \quad C \implies B, \quad D \implies A \quad \text{and} \quad C \implies D.$$

The most we can conclude is that

$$C \implies D \implies A \implies B.$$

So the only statement listed that we are certain is true is that Crups are both Arogs and Brafs.

Difficulty: Medium

NCTM Standard: Data Analysis and Probability Standard: Develop and evaluate inferences and predictions that are based on data.

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