

# Michigan Leagues of Academic Games

## Senior On-Sets Variations

**SPECIAL RULE:** The following three variations are in effect for all shakes.

1. Multiple operations Every operation sign in Required, Permitted, or Resources may be used multiple times in a Solution (Set-Name or Restriction or both).
  2. U and  $\Omega$  interchangeable Any U may represent U or  $\Omega$ , and any  $\Omega$  may represent  $\Omega$  or U.
  3. V and  $\Delta$  interchangeable Any V may represent V or  $\Delta$ , and any  $\Delta$  may represent  $\Delta$  or V.
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4. Required cube The Solution must contain a \_\_\_ cube. The player selecting this variation specifies which non-digit symbol from the Resources fills the blank in the previous sentence.
  5. Wild cube The \_\_\_ cube may represent any symbol on the cubes except a digit. The \_\_\_ cube must stand for the same symbol everywhere it occurs (Restriction(s) and Set-Name). The player selecting this variation specifies which cube from the Resources is wild. The wild cube may not be =, C, or a digit. Each Solution-writer must specify in writing the interpretation of the wild cube if it stands for anything other than itself in his Solution.
  6. Two operations The Set-Name of the Solution must contain at least two operation symbols. The operation symbols are U,  $\Omega$ , -, and '.
  7. No null Restrictions Each Restriction must remove at least one card from the Universe. In a "chain" Restriction this variation is satisfied if *any* part of the chain removes a card.
  8. Shift from Permitted On your turn you may transfer a cube in Permitted to either Required or Forbidden. This move takes the place of your regular move.
  9. Double set Each card in the Universe that is contained in the \_\_\_ set will count double for all Solutions. The player selecting this variation specifies which nonempty set of cards that does not equal the Universe counts double. The set must be named using an expression consisting of *at most four* symbols (not counting grouping symbols).
  10. Required/Forbidden card The player selecting this variation either specifies one card in the Universe which must be in the Set-Name of any Solution or specifies one card in the Universe which must *not* be in the Set-Name of any Solution.
  11. Blank card wild Each Solution-writer must specify in writing which colors, if any, are on the blank card. This variation may be chosen only if the blank card has been dealt.
  12. Absolute value Any upside-down cube in the Goal may be interpreted as rightside-up by a Solution-writer.
  13. Symmetric difference The *- symbol* means "symmetric difference;" i.e.,  $A - B = (A - B) \cup (B - A)$ , where these last two *- signs* are the usual set subtraction.
  14. Two Solutions: Each Solution-writer must write two Solutions; the Set-Name of the second Solution must contain at least one card that is not in the Set-Name of the first Solution.

**DO NOT MARK THIS SHEET!**