

Venn Puzzler: math version

Your task:

1. Come up with 3 properties or definitions of sets so that each Euler diagram is correct (on the Venn Puzzler pdf).
2. Give an example of an element belonging to each region of your Euler diagram.

Notes:

1. Each property or definition must be mathematical and precise.
2. The more succinct and elegant your properties or definitions, the more points you earn.

Bonus: you can try experimenting with finding examples of other Euler diagrams with 3 sets, as well as the 3 properties/definitions and examples in each region.