

Sect. 1.2 and 1.3

Counterexamples and Validity of Conjectures

Conjecture: All multiples of 4 are multiples of 8.

All multiples of 8 are multiples of 4.

Counterexample

- an example that invalidates a conjecture.
- all it takes is one example to disprove a conjecture!

Are the conjectures above true? How do you know?

Not all conjectures are valid. Some are false/incorrect/wrong. Just because a conjecture has been made doesn't mean we assume it is correct!

Sherlock Holmes Video

http://www.youtube.com/watch?v=4NES9LMRqAc&safety_mode=true&persist_safety_moc&safe=active



Example 1:

- Six, twelve, ten, one, fifty ...

Conjecture:

All but one of the vowels (a, e, i, o, u, and y) are used to spell numbers.

Gather evidence to support or deny this conjecture



What if you couldn't find a counterexample?

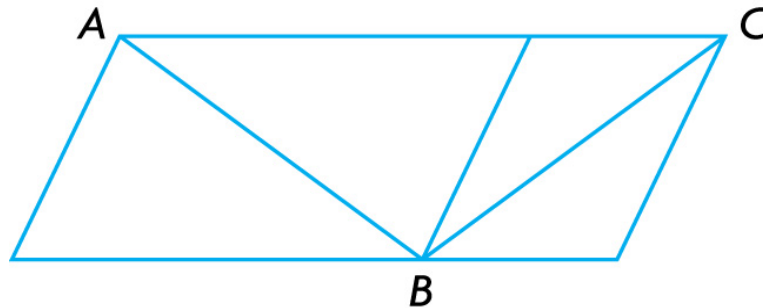
(for example: you didn't realize the vowel "a" was used).

- just because you couldn't find a counterexample you cannot be certain one doesn't exist.
- DO NOT jump to the conclusion that the conjecture is true, you just haven't proven it to be false ... yet!

Example 2:

Conjecture:

Diagonal AB is longer than Diagonal BC.



Gather evidence to support or deny this conjecture.

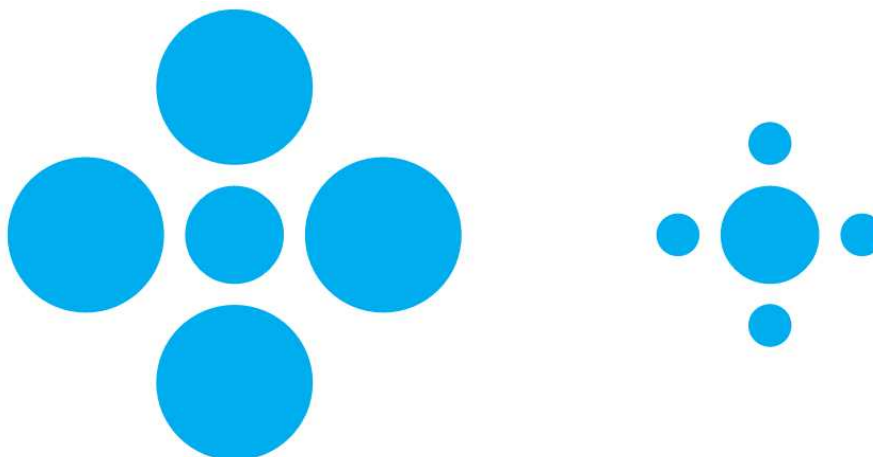
Example 3:

Make your own conjecture about this picture.

Conjecture:



Gather evidence to support or deny this conjecture.



Notes:

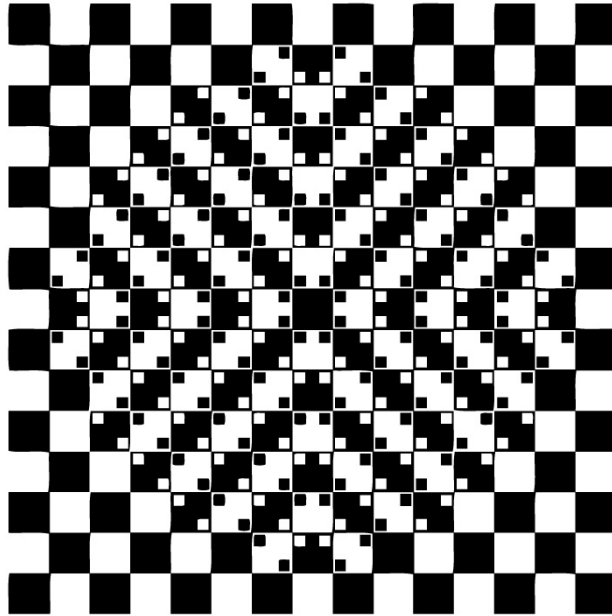
*Some conjectures initially seem to be valid but are shown to be invalid after more evidence is gathered.

*A conjecture reached through inductive reasoning should have evidence to support or refute it.

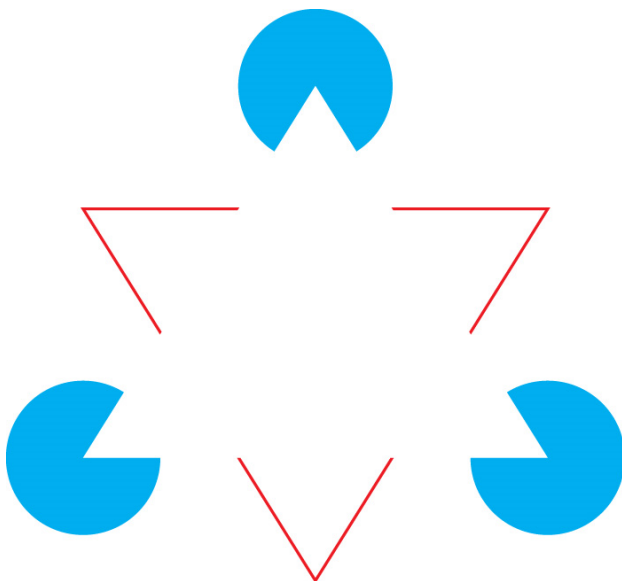
*A conjecture may be revised, based on new evidence.

Counterexamples and Validity of Conjectures.

1. Make a conjecture about the lines. Gather evidence to support or deny your conjecture.



2. The following conjecture was made:
There are two triangles in the diagram.
Gather evidence to support or deny it.



3. Following conjectures have been made by a group of students. Come up with one counterexample for each statement to disprove each conjecture.

a). Any piece of furniture having four legs is a table.

b). If the grass is wet, it is raining.

c). All students like physical education.

4. Allie creates a series of rectangles, each having different dimensions.

Length (cm)	Width (cm)	Area (cm ²)	Perimeter (cm)
5	4	20	18
10	3	30	26
6	6	36	24
8	3	24	22

Allie makes the conjecture: **The area of a rectangle is always greater than its perimeter.** Do you agree or disagree with this conjecture? Justify your reasoning.

Attachments

PM11-1s3.gsp

1s3e2 finalt.mp4

1s3e3 final.mp4