

1.2/1.3 Exploring the Validity of Conjectures – Looking for Counterexamples

Curricular Competencies:

I can think creatively with curiosity and wonder

I can apply flexible and strategic approaches to problems

I can reflect on math thinking

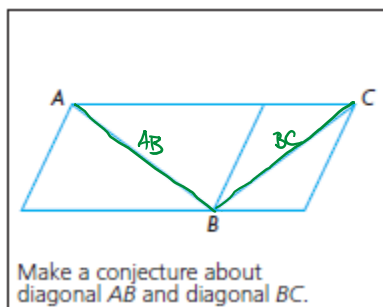
Conjectures can readily be made but to become valid: we need to provide evidence and not find an example that makes it false.

It takes only one counterexample to disprove a conjecture.

Counterexample an example that goes against the stated pattern or conjecture.

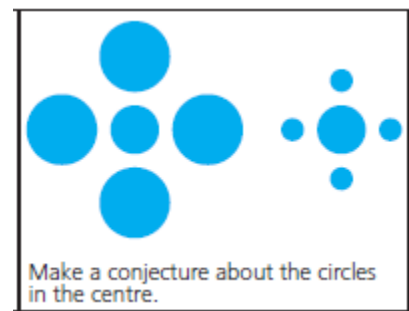
Once a conjecture is disproved it must be revised to accommodate the new information.

Ex:



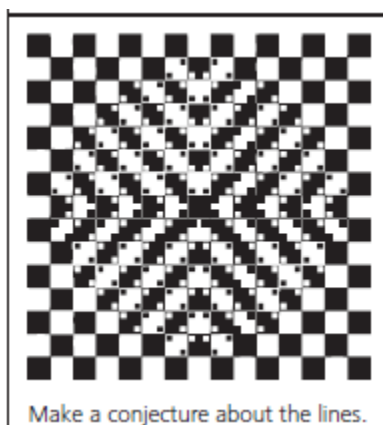
AB is longer than BC.

- measure to test.



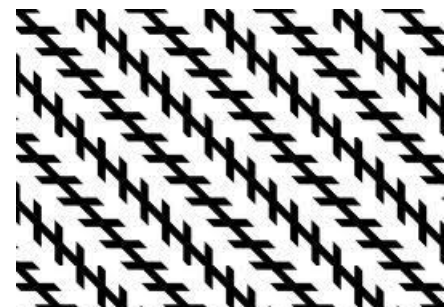
The circles are the same size.

- measure them



The lines are straight

- use a ruler to make sure.



- measure distance b/w

or protractor.

Make a conjecture about the lines

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.

Support: a, e, i, y,
- four
- eight
- twenty

Counterexample:
- one thousand

Ex. Matt found an interesting numeric pattern:

$$\underline{1} * 8 + \underline{1} = 9$$

$$\underline{12} * 8 + \underline{2} = 98$$

$$\underline{123} * 8 + \underline{3} = 987$$

$$\underline{1234} * 8 + \underline{4} = 9876$$

Matt thinks that this pattern will continue. Search for a counterexample to Matt's conjecture.

$$12345 \times 8 + 5 = 98765 \quad \checkmark$$

$$123456789 \times 8 + 9 = 987654321 \quad \checkmark$$

$$12345678910 \times 8 + 10 = 9876543129 \quad \times$$

$$1234567890 \times 8 + 10 = 9876543130 \quad \times$$

Revise the conjecture to make it valid

The pattern will continue up to and including "9."

Practice: pg 17 # 2,3

pg 22 # 1, 3, 5, 6, 9, 12, 14, 16, 17