

Exploring the Validity of Conjectures

YOU WILL NEED

- ruler
- calculator

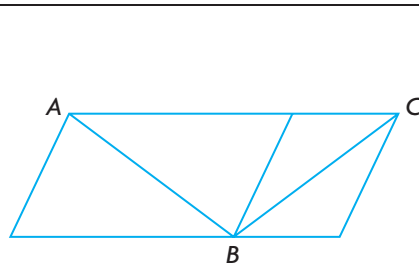
GOAL

Determine whether a conjecture is valid.

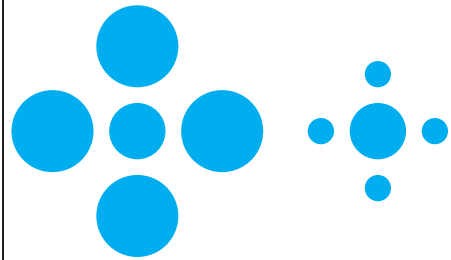
EXPLORE the Math

Your brain can be deceived.

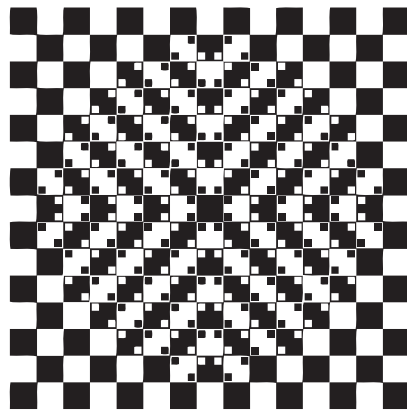
Choose two of these four optical illusions.



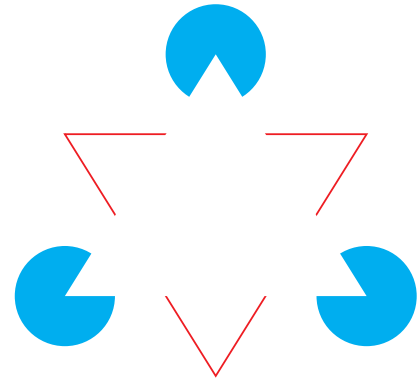
Make a conjecture about diagonal AB and diagonal BC .



Make a conjecture about the circles in the centre.



Make a conjecture about the lines.



Make a conjecture about the number of triangles.

? How can you check the validity of your conjectures?

Reflecting

- Describe the steps you took to verify your conjectures.
- After collecting evidence, did you decide to revise either of your conjectures? Explain.
- Can you be certain that the evidence you collect leads to a correct conjecture? Explain.

In Summary

Key Idea

- Some conjectures initially seem to be valid, but are shown not to be valid after more evidence is gathered.

Need to Know

- The best we can say about a conjecture reached through inductive reasoning is that there is evidence either to support or deny it.
- A conjecture may be revised, based on new evidence.

FURTHER Your Understanding

1. Make a conjecture about the dimensions of the two tabletops. How can you determine if your conjecture is valid?



2. Examine the number pattern. Make a conjecture about this pattern. What steps can you take to determine if your conjecture is valid?

$$\begin{aligned}1^2 &= 1 \\11^2 &= 121 \\111^2 &= 12321 \\1111^2 &= 1234321\end{aligned}$$

3. If two congruent regular heptagons are positioned so that they share a side, a dodecagon (12-sided polygon) is formed. If two congruent regular hexagons are positioned so that they share a side, a decagon is formed. If two congruent regular pentagons are positioned so that they share a side, an octagon is formed. Make a conjecture about positioning two congruent regular quadrilaterals so that they share a side. Determine whether your conjecture is valid. Record your evidence.

