

Day 1 – Conjectures & Counterexamples Notes

A **conjecture** is a statement that has not been rigorously proven to be true. Conjectures are made from studying a series of patterns or observations.

Practice: See if you can make a conjecture for the following statements or pictures.

1. What conjecture can you make about the twenty third term of the sequence S, A, D, S, A, D, \dots ?

Every three times and the sequence repeats itself
so the 23rd term would be A.

2. Given the sequence: 2, 4, ..., determine the conjecture each person is making.

- a. Hailey: "The next number is 8."

Hailey is multiplying each number by 2

- b. Braden: "The next number is 6."

Braden is adding each number by 2

- c. Rachel: "The next number is 7."

Rachel is increasing the number she is adding by each time by 1 (+2, +3, +4, +5, ...)

Counterexamples

A **counterexample** is an example that shows a conjecture is not true. In order to prove a conjecture is false, you just need one counterexample. See if you can determine a counterexample for the following statements:

- A. If a month begins with the letter J, it must be a summer month.

January is not a summer month.

- B. All four sided figures are parallelograms.

A trapezoid has 4 sides, but isn't a parallelogram.

- C. When you multiply a number by 3, the product is divisible by 6.

If I multiply 5×3 , 15 is not divisible by 6.

- D. You can connect any four points to form a quadrilateral.

Not if all points are on a straight line

