

2 Types of Reasoning

1. Inductive Reasoning

Ex. What is the next number in the sequence:

$$\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$$

2. Deductive Reasoning

Conjectures

*Not every conjecture is true → unproven/undecided

Ex. Goldbach's Conjecture: every even number can be written as the sum of two primes.

Counterexample:

Reasoning Process:

- 1.
- 2.
- 3.

Examples:

1. The sum of the first n odd positive integers is _____?

2. Make a conjecture for the following statement:

The product of two even numbers.

3. Find a counterexample:

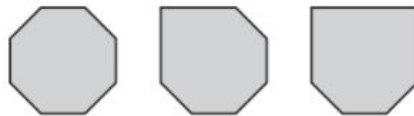
For all real numbers x , the expression x^2 is greater than or equal to x .

4. Write a conjecture that describes the pattern in the sequence below. Then use your conjecture to find the next item in the sequence.

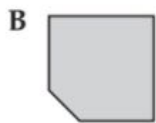
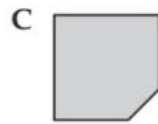


Standardized Test Practice

59. Look at the pattern below.



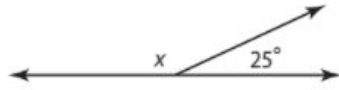
If the pattern continues, what will be the next shape?



60. **GRIDDED RESPONSE** What is the value of the expression below if $a = 10$ and $b = 1$?

$$2b + ab \div (a + b)$$

62. SAT/ACT Which of the following is equal to $2x$?



A 50°

D 310°

B 78°

E 360°

C 155°