## 2 Types of Reasoning

1. Inductive Reasoning

Ex. What is the next number in the sequence:

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

2. Deductive Reasoning

## Conjectures

*Not every conjecture is true → unproven/undecided

## 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.

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

$\frac{1}{6}, \frac{1}{3}, \frac{1}{2}, \frac{2}{3}, \_?\_, \_?\_$

1, 3, 6, 10, 15, 21, ?, ?

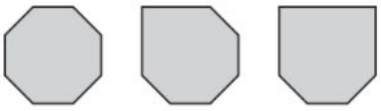
1, 4, 9, 16, 25, 36, ?, ?

1, 2, 4, 8, 16, 32, ?, ?

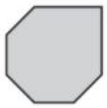
PSAT Practice!

**Standardized Test Practice**

**59.** Look at the pattern below.



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

A 

C 

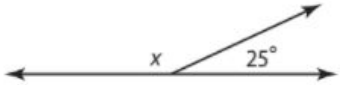
B 

D 

**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°
**B** 78°
**C** 155°
**D** 310°
**E** 360°