Name _____ Class _____ Date _____

Reteaching 4-7

Inductive and Deductive Reasoning

OBJECTIVE: Using inductive reasoning to write the next two numbers in a number pattern

MATERIALS: None

Inductive reasoning is making conclusions based on patterns. A conjecture is the conclusion you reach. Use a conjecture to find the next two numbers in a number pattern.

Example

Use inductive reasoning to describe the pattern. Then find the next two numbers.

85, 75, 65, 55, . . .

Two possible methods to determine if there is a pattern are

- find the difference between each pair of consecutive numbers,
- find the quotient of each pair of consecutive numbers.

Here, we will start by calculating the difference between each pair of consecutive numbers to see if the differences are the same.

$75 - 85 = -10$ $\quad 65 - 75 = -10$ $\quad 55 - 65 = -10$

Yes, there is a consistent pattern.

$$85 \xrightarrow{-10} 75 \xrightarrow{-10} 65 \xrightarrow{-10} 55$$

The pattern is "subtract 10 from the previous number."

To find the next two numbers, subtract 10 from each previous number.

$55 - 10 = 45$

$45 - 10 = 35$

The next two numbers are 45 and 35.

Exercises

Use inductive reasoning to describe each pattern.

1. 2, 9, 16, 23, . . . **2.** 5, 1, −3, −7, . . . **3.** 27, 9, 3, 1, . . . **4.** −52, −41, −30, −19, . . .

Find the next two terms in each pattern.

5. 1.5, 3, 6, 12, . . . **6.** 2, 0, −2, −4, . . . **7.** −4, −1, 2, 5, . . .

8. 1000, 10, 0.1, 0.001, . . . **9.** −17, −22, −27, −32, . . . **10.** $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \ldots$

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