

1.7 Inductive Reasoning

Write a rule for the number pattern and find the next three terms.

Ex) 4, 9, 14, 19, \_\_, \_\_, \_\_

Rule: *Start with 4 and add 5 each time.*

Next terms: *24, 29, 34*

~~Ex) 3, 4~~

Ex) 3, 9, 27, 81, \_\_, \_\_, \_\_

Rule: *Start with 3 and multiply by 3 each time.*

Next terms:

~~Ex) 3, 4~~

Is the conjecture correct or incorrect? If incorrect, give a counterexample.

Ex) Every four-sided figure is a rectangle.

*Incorrect - trapezoid.*

Ex) The opposite of a number is negative.

*Incorrect - opposite of -3 is +3.*

Ex) The last digit of the product of 5 and any whole number is either a 0 or a 5. *Correct.*

## Reteaching 1-7 Inductive Reasoning

The sum of two numbers is always at least as great as either number. Is the statement correct or incorrect? If incorrect, give a counterexample.

Try some examples.

$$2 + 8 = 10 \quad 10 \geq 8 \text{ and } 10 \geq 2$$

$$365 + 241 = 606 \quad 606 \geq 365 \text{ and } 606 \geq 241$$

The conjecture seems correct. Try different kinds of numbers. Although the numbers in the second trial are much larger than those in the first, all are whole numbers. Try zero, fractions, and negative numbers.

$$56 + 0 = 56 \quad 56 \geq 56 \text{ and } 56 \geq 0$$

$$\frac{3}{8} + \frac{1}{8} = \frac{1}{2} \quad \frac{1}{2} \geq \frac{3}{8} \text{ and } \frac{1}{2} \geq \frac{1}{8}$$

$$-4 + 7 = 3 \quad 3 \geq -4 \text{ but } 3 \text{ is not at least as great as } 7$$

The conjecture is incorrect and  $-4 + 7 = 3$  is a counterexample.

Reteaching

Is each conjecture correct or incorrect? If incorrect, give a counterexample.

1. The difference of two numbers is less than or equal to each number.

Incorrect; Reason:  $1 - (-2) = 3$

2. The sum of two negative numbers is always less than each number.

Correct

3. The sum of 5 and any positive integer is divisible by 5.

Incorrect; Reason:  $5 + 3 = 8$  and  $8 \neq 5$

4. A number is divisible by 10 if its last digit is 0.

Correct

5. The sum of a number and its absolute value is always 0.

Incorrect; Reason:  $8 + |8| = 16$

6. The next number in the pattern 2, 4, 8, ... is 10.

Incorrect; Reason: next # is 16

7. Every even number is divisible by 4.

Incorrect; Reason:  $14 \neq 4$

8. The next number in the pattern 5, 3, 1, ... is -1.

Correct