

# 2.1 Practice A

## *Using Inductive Reasoning to Make Conjectures*

Find the next item in each pattern.

- |                                    |   |   |
|------------------------------------|---|---|
| 1. 2, 4, 6, 8, . . .<br>_____      | 2. Z, Y, X, . . .<br>_____                  | 3. fall, winter, spring, . . .<br>_____ |
| 4. 100, 81, 64, 49, . . .<br>_____ | 5. Alabama, Alaska, Arizona, . . .<br>_____ | 6. west, south, east, . . .<br>_____    |

Fill in the blanks.

- When several examples form a pattern and you assume the pattern will continue, you are applying \_\_\_\_\_.
- A statement you believe to be \_\_\_\_\_ based on inductive reasoning is called a conjecture.
- A counterexample shows that a conjecture is \_\_\_\_\_.

For Exercises 10–12, complete each conjecture by looking for a pattern in the examples.

- The sum of two odd numbers is \_\_\_\_\_.  
 $3 + 5 = 8$        $13 + 3 = 16$        $1 + 1 = 2$
- The square of an odd number is always \_\_\_\_\_.  
 $3^2 = 9$        $25^2 = 625$        $7^2 = 49$
- The square of any negative number is \_\_\_\_\_.  
 $(-3)^2 = 9$        $(-25)^2 = 625$        $(-8)^2 = 64$

Show that each conjecture is false by finding a counterexample.

- For any number  $n$ ,  $2n > n$ . (Remember plug in possible values of  $n$  such as -1, 0, 1 and  $\frac{1}{2}$ .)  
 \_\_\_\_\_
- For any integer  $n$ ,  $n^3 > 0$ . (Remember plug in possible values of  $n$  such as -1, 0, 1 and  $\frac{1}{2}$ .)  
 \_\_\_\_\_
- Two rays having the same endpoint make an acute angle. (Sketch a counterexample.)
- Each angle in a right triangle has a different measure. (Sketch a counterexample.)

# 2.1 Practice B

## Using Inductive Reasoning to Make Conjectures

Complete the conjecture based on the pattern in the examples.

1. **Conjecture:** The product of any two even numbers is ?.

**EXAMPLES**

$4 \cdot 2 = 8$        $8 \cdot 4 = 32$        $4 \cdot 12 = 48$   
 $6 \cdot 10 = 60$        $10 \cdot 10 = 100$        $22 \cdot 20 = 440$

2. **Conjecture:** The sum of any two consecutive whole numbers is a(n) ? number.

**EXAMPLES**

$3 + 4 = 7$        $9 + 10 = 19$        $16 + 17 = 33$   
 $5 + 6 = 11$        $10 + 11 = 21$        $23 + 24 = 47$

3. **Conjecture:** The sum of any two even numbers is ?.

**EXAMPLES**

$2 + 10 = 12$        $18 + 8 = 26$        $12 + 36 = 48$   
 $6 + 4 = 10$        $14 + 6 = 20$        $22 + 8 = 30$

4. **Conjecture:** The difference of any two odd numbers is ?.

**EXAMPLES**

$9 - 3 = 6$        $15 - 1 = 14$        $27 - 3 = 24$   
 $11 - 7 = 4$        $19 - 17 = 2$        $17 - 9 = 8$

For Exercises 5–6, use the chart to make a conjecture

5. When a tree is cut horizontally, a series of rings is visible in the stump. Make a conjecture about the number of rings and the age of the tree based on the data in the table.

Number of Rings	3	15	22	60
Age of Tree (years)	3	15	22	60

6. Assume your conjecture in Exercise 8 is true. Find the number of rings in an 82-year-old oak tree. \_\_\_\_\_

Make a conjecture about each pattern. Write the next two items.

