

Algebra I  
Worksheet 1.1  
Representing Number Patterns

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_ HOUR: \_\_\_\_\_

**There are six players in a backgammon tournament. If each player must play every other player once, how many games need to be played?**

1. Let  $A, B, C, D, E,$  and  $F$  represent the players. Draw line segments connecting each point to every other point.



2. Find the total number of line segments. \_\_\_\_\_
3. State a conclusion about the number of games that need to be played and the number of line segments drawn.

**Find the next three numbers in each pattern.**

4. 12, 17, 22, 27, 32, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
5. 2, 2, 4, 6, 10, 16, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ (Fibonacci-type)
6. 19, 35, 51, 67, 83, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
7. 29, 24, 30, 25, 31, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**Each table represents a different rule. First find the missing numbers for each table and then state a rule for each.**

1.

Number	Number
1	5
2	7
3	9
	11
5	

2.

Word	Number
triangle	3
pentagon	5
	6
square	
octagon	

This rule is: start with 5 then add \_\_\_\_\_

The rule is: \_\_\_\_\_

**Find the next three numbers in each pattern.**

1. 23, 22, 20, 17, \_\_\_\_\_
2. 39, 35, 30, 24, \_\_\_\_\_
3. 15, 19, 12, 16, \_\_\_\_\_
4. 4, 7, 12, 19, \_\_\_\_\_

## SEEING PATTERNS

Write the next five numbers in each set.

1. 44, 43, 42, 41, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_
2. 94, 95, 96, 97, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_
3. 1, 3, 5, 7, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_
4. 2, 4, 6, 8, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_
5. 5, 10, 15, 20, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_
6. 41, 39, 37, 35, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_
7. 3, 6, 9, 12, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_
8. 150, 140, 130, 120, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_

What is the next number?

9. 4, 8, 16, 32, 64, \_\_\_\_\_
10. 1, 2, 3, 5, 7, 9, 12, 15, \_\_\_\_\_
11. 9, 4, 4, 7, 4, 9, 4, 4, 7, 4, 9, 4, \_\_\_\_\_
12. 2, 3, 5, 9, 17, 33, 65, \_\_\_\_\_
13. 2, 3, 5, 6, 8, 9, 11, 12, \_\_\_\_\_
14. 100, 99, 97, 94, 90, \_\_\_\_\_
15. 20, 22, 23, 26, 27, 28, 32, 33, 34, 35, 40, 41, 42, 43, \_\_\_\_\_
16. 1, 3, 6, 10, 15, 21, 28, \_\_\_\_\_

Fill in the blanks, and extend the pattern.

1. A, B, \_\_\_\_, \_\_\_\_, E, \_\_\_\_, \_\_\_\_
2. A, 1, B, \_\_\_\_, \_\_\_\_, 3, \_\_\_\_, \_\_\_\_
3. A, Z, B, \_\_\_\_, \_\_\_\_, X, \_\_\_\_, \_\_\_\_
4. 1, 3, 5, \_\_\_\_, \_\_\_\_, 11, \_\_\_\_, \_\_\_\_
5. Z, 20, 30, Y, 40, \_\_\_\_, \_\_\_\_, \_\_\_\_, 70, \_\_\_\_, \_\_\_\_

Many patterns have 2 number conditions. Match the pattern to the rule.

- |   |                                   |
|---|-----------------------------------|
| 6. 2, 4, 8, 16                              | A. double the number              |
| 7. 2, 5, 11, 23, ...                        | B. divide by 2, then add one      |
| 8. 6, 10, 18, 34 ...                        | D. double numbers and add 1       |
| 9. 14, 8, 5, $\frac{7}{2}$ , $\frac{11}{4}$ | F. a series of squares            |
| 10. 1, 4, 9, 16, 25                         | G. double the number & subtract 2 |