

# Numerical Patterns and Relationships


Grade 5 Math • Section 3.5


Name: \_\_\_\_\_

Date: \_\_\_\_\_


Score: \_\_\_\_\_ / 10


## Quick Review and Helpful Hints


 **Pattern rule:** A rule tells you how to generate each term. Example: “Start at 1, add 3” gives 1, 4, 7, 10, 13, ...

 **Comparing two patterns:** Generate terms for both rules, form ordered pairs, and look for a relationship between corresponding terms.

 You can graph ordered pairs on a coordinate plane to see the relationship visually.

 **Example:** Rule A: start at 0, add 2. Rule B: start at 0, add 6. Find the first 5 terms of each and describe the relationship.

 Rule A: 0, 2, 4, 6, 8. Rule B: 0, 6, 12, 18, 24. Each term in B is 3 times the corresponding term in A. Ordered pairs: (0, 0), (2, 6), (4, 12), (6, 18), (8, 24).

 **Answer:** Each term in B is 3 times the corresponding term in A

## Practice Problems

Generate terms and describe the relationship between the two patterns.

- Rule A: start at 0, add 3. Rule B: start at 0, add 9. Write the first 5 terms of each. \_\_\_\_\_
- In the patterns above, each term in B is \_\_\_\_\_ times the corresponding term in A. \_\_\_\_\_
- Rule A: start at 0, add 4. Rule B: start at 0, add 8. Write the first 5 terms of each. \_\_\_\_\_
- Write the ordered pairs (A, B) for the two patterns above. \_\_\_\_\_
- Rule A: start at 1, add 5. Rule B: start at 2, add 10. Write the first 5 terms of each. \_\_\_\_\_
- What is the relationship between corresponding terms in the two patterns above? \_\_\_\_\_
- Rule A: start at 0, add 1. Rule B: start at 0, add 7. Write the first 5 ordered pairs. \_\_\_\_\_
- Create your own two rules where each term in Rule B is 4 times the term in Rule A. \_\_\_\_\_

## Word Problems

- A machine fills 5 bottles per minute on Line A and 15 bottles per minute on Line B. After 6 minutes, how many bottles has each line filled? Describe the relationship. \_\_\_\_\_
- Jenna saves \$4 each week. Her brother saves \$12 each week. Write the first 5 terms of each pattern and describe how the amounts are related. \_\_\_\_\_



## Answer Keys

- |   |   |
|---|---|
| <p>1. <math>A : 0, 3, 6, 9, 12; B : 0, 9, 18, 27, 36</math></p> <p>2. <math>3</math></p> <p>3. <math>A : 0, 4, 8, 12, 16; B : 0, 8, 16, 24, 32</math></p> <p>4. <math>(0, 0), (4, 8), (8, 16), (12, 24), (16, 32)</math></p> <p>5. <math>A : 1, 6, 11, 16, 21; B : 2, 12, 22, 32, 42</math></p> | <p>6. <math>B = 2A</math></p> <p>7. <math>(0, 0), (1, 7), (2, 14), (3, 21), (4, 28)</math></p> <p>8. Example: <math>A : 0, 2, 4, 6, 8; B : 0, 8, 16, 24, 32</math></p> <p>9. <math>A : 30, B : 90; B = 3A</math></p> <p>10. <math>J : 4, 8, 12, 16, 20; B : 12, 24, 36, 48, 60; B = 3J</math></p> |
|---|---|

### Step-by-Step Explanations

1. Start with the main idea. For numerical patterns and relationships, add 3 each time for A and 9 each time for B. Write the terms in order so the relationship between the two rules is easy to see.
2. Keep the work tidy. For numerical patterns and relationships, each B term is 3 times the matching A term. Ordered pairs come from matching terms in the same position.
3. Look at what the numbers mean. For numerical patterns and relationships, add 4 for A and 8 for B. A constant multiplier between the two lists usually shows up clearly in the table.
4. Use the setup first. For numerical patterns and relationships, pair each A value with the corresponding B value. Write the terms in order so the relationship between the two rules is easy to see.
5. Check the size of the answer. For numerical patterns and relationships, start with the given first term and keep adding the rule amount. Ordered pairs come from matching terms in the same position.
6. Match the operation to the words. For numerical patterns and relationships, each B term is twice the matching A term. A constant multiplier between the two lists usually shows up clearly in the table.
7. Write the important values first. For numerical patterns and relationships, pair each A term with the matching B term. Write the terms in order so the relationship between the two rules is easy to see.
8. Follow the pattern carefully. For numerical patterns and relationships, any valid rule works if every B value is 4 times A. Ordered pairs come from matching terms in the same position.
9. Start with the main idea. For numerical patterns and relationships, after 6 minutes, Line A fills  $5 \times 6 = 30$  and Line B fills  $15 \times 6 = 90$ . A constant multiplier between the two lists usually shows up clearly in the table.
10. Keep the work tidy. For numerical patterns and relationships, her brother saves 3 times as much each week. Write the terms in order so the relationship between the two rules is easy to see.



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