

# Graphing Patterns on the Coordinate Plane

Grade 5 Math • Section 10.5

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

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

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

## Quick Review and Helpful Hints

**Steps:** (1) Generate terms for each pattern using the given rules. (2) Form ordered pairs from corresponding terms. (3) Plot the ordered pairs on the coordinate plane. (4) Describe the relationship.

The resulting points may form a straight line or other pattern.

Make sure to pair terms from the **same position** in each sequence (1st with 1st, 2nd with 2nd, etc.).

**Example:** Rule A: start at 0, add 2. Rule B: start at 0, add 4. Generate 5 ordered pairs and describe the relationship.

A: 0, 2, 4, 6, 8. B: 0, 4, 8, 12, 16. Pairs: (0, 0), (2, 4), (4, 8), (6, 12), (8, 16). Each  $y$ -value is 2 times the corresponding  $x$ -value. The points form a straight line through the origin.

**Answer:**  $y = 2x$ ; the points form a straight line

## Practice Problems

Generate ordered pairs and describe the relationship.

- Rule A: start at 0, add 1. Rule B: start at 0, add 3. Write 5 ordered pairs. \_\_\_\_\_
- What is the relationship between the  $x$ - and  $y$ -values above? \_\_\_\_\_
- Rule A: start at 0, add 3. Rule B: start at 0, add 6. Write 5 ordered pairs. \_\_\_\_\_
- What is the relationship between the  $x$ - and  $y$ -values above? \_\_\_\_\_
- Rule A: start at 0, add 5. Rule B: start at 0, add 10. Write 5 ordered pairs. \_\_\_\_\_
- Rule A: start at 0, add 2. Rule B: start at 0, add 6. Write 5 ordered pairs and describe the pattern. \_\_\_\_\_
- Rule A: start at 1, add 1. Rule B: start at 3, add 3. Write 5 ordered pairs. \_\_\_\_\_
- Will all the patterns above form straight lines when graphed? Explain. \_\_\_\_\_

## Word Problems

- A lemonade stand sells cups for \$2 each. Create a table showing the number of cups ( $x$ : 0, 1, 2, 3, 4, 5) and total earnings ( $y$ ). Write the ordered pairs and describe the relationship. \_\_\_\_\_
- Mia walks 3 blocks per minute. Her brother walks 1 block per minute. Generate 5 ordered pairs (brother's blocks, Mia's blocks) starting at 0. Graph and describe the relationship. \_\_\_\_\_



## Answer Keys

- $(0, 0), (1, 3), (2, 6), (3, 9), (4, 12)$
- $y = 3x$
- $(0, 0), (3, 6), (6, 12), (9, 18), (12, 24)$
- $y = 2x$
- $(0, 0), (5, 10), (10, 20), (15, 30), (20, 40)$
- $(0, 0), (2, 6), (4, 12), (6, 18), (8, 24); y = 3x$
- $(1, 3), (2, 6), (3, 9), (4, 12), (5, 15)$
- Yes
- $(0, 0), (1, 2), (2, 4), (3, 6), (4, 8), (5, 10); y = 2x$
- $(0, 0), (1, 3), (2, 6), (3, 9), (4, 12); y = 3x$

### Step-by-Step Explanations

- Start with the main idea. For graphing patterns on the coordinate plane, list the first five values from each rule and pair them. Write the terms in order so the relationship between the two rules is easy to see.
- Keep the work tidy. For graphing patterns on the coordinate plane, each  $y$ -value is 3 times its  $x$ -value. Ordered pairs come from matching terms in the same position.
- Look at what the numbers mean. For graphing patterns on the coordinate plane, pair the terms from the two rules. A constant multiplier between the two lists usually shows up clearly in the table.
- Use the setup first. For graphing patterns on the coordinate plane, each  $y$ -value is 2 times its  $x$ -value. Write the terms in order so the relationship between the two rules is easy to see.
- Check the size of the answer. For graphing patterns on the coordinate plane, pair each  $A$  term with the matching  $B$  term. Ordered pairs come from matching terms in the same position.
- Match the operation to the words. For graphing patterns on the coordinate plane, every  $B$  term is 3 times  $A$ . A constant multiplier between the two lists usually shows up clearly in the table.
- Write the important values first. For graphing patterns on the coordinate plane, use the first five terms from both rules. Write the terms in order so the relationship between the two rules is easy to see.
- Follow the pattern carefully. For graphing patterns on the coordinate plane, each pattern has a constant rate, so the graphed points fall on a straight line. Ordered pairs come from matching terms in the same position.
- Start with the main idea. For graphing patterns on the coordinate plane, earnings are 2 times the number of cups sold. A constant multiplier between the two lists usually shows up clearly in the table.
- Keep the work tidy. For graphing patterns on the coordinate plane, mia walks 3 times as many blocks as her brother each minute. Write the terms in order so the relationship between the two rules is easy to see.



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