# Pattern Match-Up

Connect number lists to pattern rules.

**3.PFA.1.e** · Investigate and explain the connection between two different representations of the same increasing or decreasing pattern.

Name _____ Date _____

**Two Ways to Show a Pattern**

A pattern can be shown as a list of numbers or as a rule. Check how much each number changes. For example, 73, 88, 103 matches the rule, “Start at 73. Add 15 each time.”

**Worked example**

A pattern is shown two ways: 13, 19, 25, 31 and “Start at 13. Add 6 each time.” How do the representations connect?

1. The first number is 13.
2. 19 - 13 = 6.
3. Each new number is 6 more than the number before it.
4. The list follows the rule, “Start at 13. Add 6 each time.”

**Both representations show a pattern that starts at 13 and adds 6 each time.**

**1. Practice**

The pattern is 4, 8, 12, 16. The rule says, “Start at 4. Add 4 each time.” Write the next number.

**2. Practice**

Pattern A is 30, 27, 24, 21. Pattern B says, “Start at 30. Subtract 3 each time.” Are Pattern A and Pattern B the same? Explain.

**3. Practice**

The pattern is 10, 14, 18, 22. Which rule matches the pattern?

**4. Practice**

A rule says, “Start at 40. Subtract 4 each time.” Write the next three numbers.

**5. Practice**

The pattern is 9, 18, 27, 36. Write the rule and the next number.

**6. Practice**

Mia writes 55, 50, 45, 40. Leo writes the rule, “Start at 55. Subtract 5 each time.” Write the next two numbers.

**7. Apply**

Use the table. At the end of Level 1 you have 14 points. You gain 4 points for each additional level. Explain how this rule matches the table. How many points will you have at the end of Level 5?

Game Points

| Level | Points |
|---|---|
| 1 | 14 |
| 2 | 18 |
| 3 | 22 |
| 4 | 26 |

**8. Apply**

In a video game, a countdown starts at 63. After each round, the display shows 56, 49, 42, and 35. Sam says the rule is, “Start at 63. Subtract 7 each round.” Is Sam correct? What number will show after five rounds?

**9. Challenge**

Ava writes 47, 42, 37, 32. Ben says the rule is, “Start at 47. Subtract 4 each time.” Is Ben's rule correct? Write the correct rule, the next two numbers, and explain how you know.

**What to accept**

Accept equivalent rule wording, such as “take away 4” for “subtract 4.” For explanations, accept statements that correctly identify the same starting number and constant change in both representations.

**1. Practice**

20

**2. Practice**

Yes. Both start at 30 and subtract 3 each time.

**3. Practice**

Start at 10. Add 4 each time.

**4. Practice**

36, 32, 28

**5. Practice**

Start at 9. Add 9 each time. The next number is 45.

**6. Practice**

35, 30

**7. Apply**

The points increase by 4 at each level. After Level 5, you will have 30 points.

Compare each pair of point totals in the table. Add 4 to 26 to find the Level 5 total.

**8. Apply**

Yes. The number after five rounds will be 28.

Each number on the display is 7 less than the one before it. Continue the pattern from 35 to 28.

**9. Challenge**

No. The correct rule is, “Start at 47. Subtract 5 each time.” The next two numbers are 27 and 22. Each number is 5 less than the number before it.