LESSON MAKER PRO

Pattern Paths

Find the rule, then keep the pattern going.

GRADE 4 · 4.PFA.1.a

4.PFA.1.a "Identify, describe, extend, and create increasing and decreasing patterns using various representations (e.g., objects, pictures, numbers, number lines, input/output tables, and function machines)."

NAME _____ DATE _____

FOLLOW THE CHANGE

An increasing pattern gets greater by the same rule each time. A decreasing pattern gets smaller by the same rule each time. Compare nearby terms to find the change, then use that change to extend the pattern.

WORKED EXAMPLE

Extend the pattern: 13, 18, 23, 28, ____. Describe the rule.

1. 18 is 5 more than 13.
2. 23 is 5 more than 18.
3. The rule is add 5 each time.
4. 28 + 5 = 33.

Answer: Add 5 each time; 33

PRACTICE 6 problems

1 Extend the increasing pattern: 4, 8, 12, ___, ___.

ANSWER _____

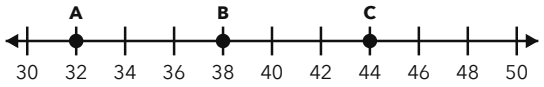
2 Look at the pattern: 63, 56, 49, ___. Is it increasing or decreasing? Write the rule and the next number.

ANSWER _____

3 Extend the pattern: 5, 10, 20, 40, ___, ___.

ANSWER _____

4 The labeled points A, B, and C show a pattern. Describe the rule. What number comes next?



ANSWER _____

5 An input/output pattern has these pairs: input 1, output 30; input 3, output 34; input 5, output 38. The inputs rise by 2 each time. Describe how the outputs change. What output goes with input 7?

ANSWER _____

6 Extend the decreasing pattern: 81, 72, 63, ___.

ANSWER _____

APPLY IT Show your work

1 A gaming club earns points each week. Use the table to find the pattern. If the pattern continues, how many points will the club have in week 5?

GAMING CLUB POINTS

Week	Points
1	24
2	30
3	36

ANSWER _____

2 A trading-card booth starts with 96 cards in a bin. Nine cards are sold each hour. Write the amounts at the start and after hours 1, 2, and 3. Then find how many cards are left after 5 hours.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Create a five-term decreasing pattern that starts at 90 and has 66 as its fourth term. Use the same subtraction rule each time. Write the pattern, the rule, and explain how you found the rule.

WORK SPACE AND ANSWER

ANSWER KEY

Pattern Paths

GRADE 4 · 4.PFA.1.a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Extend the increasing pattern: 4, 8, 12, ___, ___.	**16, 20**
2	Look at the pattern: 63, 56, 49, ___. Is it increasing or decreasing? Write the rule and the next number.	**Decreasing; subtract 7 each time; 42**
3	Extend the pattern: 5, 10, 20, 40, ___, ___.	**80, 160**
4	The labeled points A, B, and C show a pattern. Describe the rule. What number comes next?	**Add 6 each time; 50**
5	An input/output pattern has these pairs: input 1, output 30; input 3, output 34; input 5, output 38. The inputs rise by 2 each time. Describe how the outputs change. What output goes with input 7?	**The outputs add 4 each time; 42**
6	Extend the decreasing pattern: 81, 72, 63, ___.	**54**

PART 2 · APPLY IT

1. **48 points** The points increase by 6 each week. Continue from 36: week 4 is 42 and week 5 is 48.
2. **Start: 96; after 1 hour: 87; after 2 hours: 78; after 3 hours: 69; after 5 hours: 51 cards** Subtract 9 for each hour. After 5 hours, 96 - 45 = 51.

CHALLENGE

90, 82, 74, 66, 58; subtract 8 each time. From 90 to 66 is 24 over 3 equal steps, and 24/3 = 8.

Accept equivalent descriptions of the rules, such as "go up by 6" for "add 6 each time." For the challenge, accept any clear explanation that shows the constant change is subtract 8.