

Pattern Power

Find the rule, then keep it going.

GRADE 5 • 5.PFA.1

5.PFA.1 "The student will identify, describe, extend, and create increasing and decreasing patterns with whole numbers, fractions, and decimals, including those in context, using various representations. Identify, describe, extend..."

NAME _____

DATE _____

SPOT THE CHANGE

Look at how each number changes. If the same one operation happens each time, use it to find the rule and continue the pattern. In an input/output table, apply the rule to each input to get the output.

WORKED EXAMPLE

A pattern begins 16, 23, 30, ____.
What is the rule and the next term?

1. $23 - 16 = 7$.

2. $30 - 23 = 7$, so add 7 each time.

3. $30 + 7 = 37$.

Answer: Rule: add 7. Next term: 37.

PRACTICE 6 problems

- 1** 1. Complete the pattern: 9, 15, 21, ____, ____.
Describe the rule.

ANSWER _____

- 2** 2. Complete the pattern: 6.9, 6.5, 6.1, ____, ____.
Describe the rule.

ANSWER _____

- 3** 3. Complete the pattern: 10/12, 8/12, 6/12, ____, ____.
Describe the rule.

ANSWER _____

- 4** 4. Use the input/output table. What is the rule? Then find the missing output. Input: 4, 9, 13, 18 Output: 12, 17, 21, ____

ANSWER _____

- 5** 5. A function machine changes each input into an output. Input: 36, 48, 60 Output: 9, 12, ____ What is the rule? What is the missing output?

ANSWER _____

- 6** 6. The labeled marks on a number line are 1.25, 1.50, 1.75, ____, ____.
Describe the rule and fill in the missing marks.

ANSWER _____

APPLY IT Show your work

- 1** At an arcade, Jada earns 14 tickets for each quest she completes. The table shows the pattern.
Quests: 1, 3, 5 Tickets: 14, 42, 70 What is the input/output rule? How many tickets will Jada earn for 8 quests?

WORK SPACE

ANSWER _____

- 2** At the game design club, each new level takes $\frac{2}{5}$ hour longer to build than the level before it. The first three build times are $\frac{1}{5}$ hour, $\frac{3}{5}$ hour, and $\frac{5}{5}$ hour. Describe the rule and give the next two build times.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A function machine follows one rule. Input: 8, __, 12, 15 Output: 72, 99, 108, 135 Describe the rule. Find the missing input and explain how you checked it.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	1. Complete the pattern: 9, 15, 21, __, __. Describe the rule.	Add 6; 27, 33.
2	2. Complete the pattern: 6.9, 6.5, 6.1, __, __. Describe the rule.	Subtract 0.4; 5.7, 5.3.
3	3. Complete the pattern: 10/12, 8/12, 6/12, __, __. Describe the rule.	Subtract 2/12; 4/12, 2/12.
4	4. Use the input/output table. What is the rule? Then find the missing output. Input: 4, 9, 13, 18 Output: 12, 17, 21, __	Rule: add 8. Missing output: 26.
5	5. A function machine changes each input into an output. Input: 36, 48, 60 Output: 9, 12, __ What is the rule? What is the missing output?	Rule: divide by 4. Missing output: 15.
6	6. The labeled marks on a number line are 1.25, 1.50, 1.75, __, __. Describe the rule and fill in the missing marks.	Add 0.25; 2.00, 2.25.

PART 2 • APPLY IT

- Rule: multiply the number of quests by 14. Jada will earn 112 tickets.** Multiply each number of quests by 14. For 8 quests, 8 multiplied by 14 equals 112.
- Rule: add 2/5 hour each time. The next two build times are 7/5 hour and 9/5 hour.** Add 2/5 to each build time. After 5/5, the times are 7/5 and 9/5.

CHALLENGE

Rule: multiply by 9. Missing input: 11. Check: 11 multiplied by 9 equals 99.

Accept equivalent fractions and mixed numbers for the second word problem, such as $1\frac{2}{5}$ and $1\frac{4}{5}$. Accept a rule written in words or with an operation symbol when it correctly describes the change.