LESSON MAKER PRO

Pattern Power

Find the rule, then keep the pattern going.

GRADE 5 · 5.PFA.1.c

5.PFA.1.c "Solve contextual problems that involve identifying, describing, and extending increasing and decreasing patterns using single-operation input and output rules (limited to addition, subtraction, multiplication..."

NAME _____ DATE _____

ONE RULE EACH TIME

An input-output pattern uses the same one-step rule for every pair. Compare an input and its output to find whether the rule adds, subtracts, multiplies, or divides. Then use that same rule to extend the pattern.

WORKED EXAMPLE

A pattern machine adds 7. What is the output for an input of 12?

1. Start with the input, 12.
2. Use the rule: add 7.
3. 12 + 7 = 19.

Answer: 19

PRACTICE 6 problems

1 A machine has these pairs: 6 to 18 and 10 to 30. What is the rule? Then find the output for 14.

ANSWER _____

2 A pattern starts at 40 and follows the rule subtract 8. The outputs are 40, 32, 24, __, __. Write the next two outputs.

ANSWER _____

3 A machine has these pairs: 36 to 9 and 52 to 13. What is the rule? Then find the output for 68.

ANSWER _____

4 A fraction machine has these pairs: 1/8 to 4/8 and 3/8 to 6/8. What is the rule? What input gives an output of 5/8?

ANSWER _____

5 A pattern follows the rule subtract 3/10. Complete the pattern: 9/10 to 6/10, 7/10 to 4/10, 5/10 to __.

ANSWER _____

6 A decimal machine adds 0.35. Complete the pattern: 1.25 to 1.60, 2.40 to 2.75, 3.05 to __.

ANSWER _____

APPLY IT Show your work

1 At an arcade, a player gets 15 bonus tickets added to the tickets won in one game. The pattern shows 3 tickets won to 18 tickets total, 5 tickets won to 20 tickets total, and 8 tickets won to 23 tickets total. What is the rule? How many tickets total will the player have if they win 10 tickets in a game?

WORK SPACE

ANSWER _____

2 In a fantasy game, a character's energy is shown in sixths. One move uses 2/6 of the energy. The pattern shows 5/6 to 3/6, 4/6 to 2/6, and 3/6 to 1/6. What is the rule? What energy is left after a character starts with 2/6?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A points machine follows one rule. It changes 3.20 to 2.75 and 4.05 to 3.60. An output is 5.15. What was the input? Explain how you know.

WORK SPACE AND ANSWER

ANSWER KEY

Pattern Power

GRADE 5 · 5.PFA.1.c

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A machine has these pairs: 6 to 18 and 10 to 30. What is the rule? Then find the output for 14.	**Multiply by 3; 42**
2	A pattern starts at 40 and follows the rule subtract 8. The outputs are 40, 32, 24, __, __. Write the next two outputs.	**16, 8**
3	A machine has these pairs: 36 to 9 and 52 to 13. What is the rule? Then find the output for 68.	**Divide by 4; 17**
4	A fraction machine has these pairs: 1/8 to 4/8 and 3/8 to 6/8. What is the rule? What input gives an output of 5/8?	**Add 3/8; 2/8**
5	A pattern follows the rule subtract 3/10. Complete the pattern: 9/10 to 6/10, 7/10 to 4/10, 5/10 to __.	**2/10**
6	A decimal machine adds 0.35. Complete the pattern: 1.25 to 1.60, 2.40 to 2.75, 3.05 to __.	**3.40**

PART 2 · APPLY IT

1. **Add 15; 25 tickets total** The total is always 15 more than the number of tickets won. Add 15 to 10 to get 25.
2. **Subtract 2/6; 0** Each move subtracts 2/6 from the starting energy. Subtracting 2/6 from 2/6 leaves 0.

CHALLENGE

5.60

Accept equivalent fraction answers, such as 1/4 for 2/8 and 1/5 for 2/10. Students may state a rule in words or with an operation sentence.