LESSON MAKER PRO

Rule Detectives

Find the operation that fits every input and output.

GRADE 4 · 4.A.1.2

4.A.1.2 "Describe the single operation rule for a pattern from an input/output table or function machine involving any operation of a whole number."

NAME _____ DATE _____

ONE RULE FOR EVERY ROW

An input/output table shows what a machine does to each input. Find one addition, subtraction, multiplication, or division rule that works for every row.

WORKED EXAMPLE

What rule changes each input to its output?

NUMBER MACHINE

Input	Output
3	27
5	45
9	81

1. 27 / 3 = 9.
2. 5 * 9 = 45.
3. 9 * 9 = 81.

Answer: Multiply by 9.

PRACTICE 4 problems

1 12 -> 20, 15 -> 23, 18 -> 26. What is the rule?

ANSWER _____

2 14 -> 10, 19 -> 15, 24 -> 20. What is the rule?

ANSWER _____

3 16 -> 32, 21 -> 42, 25 -> 50. What is the rule?

ANSWER _____

4 36 -> 12, 48 -> 16, 60 -> 20. What is the rule?

ANSWER _____

APPLY IT Show your work

1 Each sticker pack has the same number of stickers. What rule changes packs to stickers?

STICKER PACKS

Packs	Stickers
2	14
4	28
6	42

ANSWER _____

2 At an arcade, 40 points buy 10 tokens, and 64 points buy 16 tokens. What rule changes points to tokens?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A machine changes 32 -> 16, 40 -> 24, and 48 -> 32. Give its rule. Explain why dividing by 2 does not work.

WORK SPACE AND ANSWER

ANSWER KEY

Rule Detectives

GRADE 4 · 4.A.1.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	12 -> 20, 15 -> 23, 18 -> 26. What is the rule?	**Add 8.**
2	14 -> 10, 19 -> 15, 24 -> 20. What is the rule?	**Subtract 4.**
3	16 -> 32, 21 -> 42, 25 -> 50. What is the rule?	**Multiply by 2.**
4	36 -> 12, 48 -> 16, 60 -> 20. What is the rule?	**Divide by 3.**

PART 2 · APPLY IT

1. **Multiply by 7.** Each pack has 7 stickers, and multiplying each pack count by 7 matches the table.
2. **Divide by 4.** 40 / 4 = 10 and 64 / 4 = 16.

CHALLENGE

Subtract 16. Dividing 40 by 2 gives 20, not 24.

Accept equivalent descriptions such as “take away 16” for “subtract 16.” For the challenge, the explanation may use either of the last two input/output pairs.