LESSON MAKER PRO

Rule Matchup

Compare rules that multiply and rules that add.

GRADE 6 · TEKS 6.4.A

6.4.A "compare two rules verbally, numerically, graphically, and symbolically in the form of y = ax or y = x + a in order to differentiate between additive and multiplicative relationships;"

NAME _____ DATE _____

SPOT THE RULE

A multiplicative rule y=ax multiplies each x by a and passes through (0,0). An additive rule y=x+a adds a to each x and has y-intercept a, which can be 0. Compare tables, points, and equations by checking whether y is multiplied by a factor or shifted by the same added amount.

WORKED EXAMPLE

Compare y=4x and y=x+4 when x=3.

1. Substitute x=3 into y=4x.
2. y=4(3)=12.
3. Substitute x=3 into y=x+4.
4. y=3+4=7.

Answer: At x=3, y=4x gives 12 and y=x+4 gives 7. The first rule is multiplicative, and the second rule is additive.

PRACTICE 6 problems

1 Compare y=5x and y=x+5 when x=1. Give both y-values and name each relationship.

ANSWER _____

2 Complete the table for y=6x. x: 0, 1, 5. y: __, __, __. Is the rule additive or multiplicative?

ANSWER _____

3 A rule adds 8 to every input. Write the rule as an equation. Find y when x=0, and name the relationship.

ANSWER _____

4 A graph has points (0,0), (1,9), and (5,45). Write the equation and name the relationship.

ANSWER _____

5 Which rule matches this table? x: 0, 1, 6. y: 10, 11, 16. Choose y=10x or y=x+10. Name the relationship.

ANSWER _____

6 Rule P has graph points (0,0) and (6,30). Rule Q has graph points (0,8) and (6,14). Write an equation for each rule. Then state which rule is multiplicative.

ANSWER _____

APPLY IT Show your work

1 A game app offers two token plans. Plan M gives 9 tokens for each level you finish, starting at 0 tokens. Plan A gives 10 starting tokens and 1 token for each level. Write a rule for each plan. After 5 levels, how many tokens does each plan give? Name the relationship type of each rule.

WORK SPACE

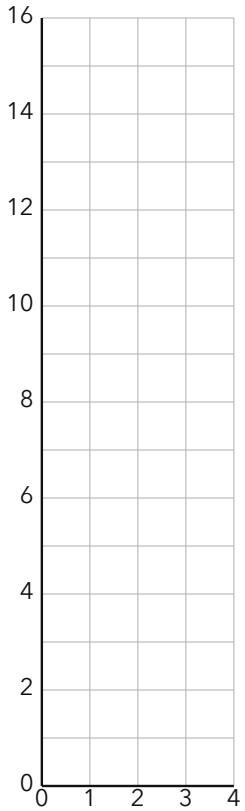
ANSWER _____

2 At a sticker swap, Luis starts with 8 stickers and gets 1 sticker each day. Nia starts with 0 stickers and gets 6 stickers each day. Write rules for total stickers y after x days. How many stickers does each person have after 5 days? Name the relationship type of each rule.

WORK SPACE

ANSWER _____

3 Compare the worked-example rules on the shared axes below. Plot and connect P: (0,0), (1,4), (2,8), (3,12), and Q: (0,4), (1,5), (2,6), (3,7). Label each line P or Q. Which graph passes through the origin, which starts at 4, and how much does each rise for an increase of 1 in x? Connect your observations to y=4x and y=x+4. Use separate paper for your explanation.



ANSWER _____

CHALLENGE One step up

Two game score rules are y=6x and y=x+25. At what x-value do the rules have the same y-value? Explain by showing an equation and checking your answer.

WORK SPACE AND ANSWER

ANSWER KEY

Rule Matchup

GRADE 6 · TEKS 6.4.A

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Compare y=5x and y=x+5 when x=1. Give both y-values and name each relationship.	**For y=5x, y=5, so it is multiplicative. For y=x+5, y=6, so it is additive.**
2	Complete the table for y=6x. x: 0, 1, 5. y: __, __, __. Is the rule additive or multiplicative?	**y-values: 0, 6, 30. The rule is multiplicative.**
3	A rule adds 8 to every input. Write the rule as an equation. Find y when x=0, and name the relationship.	**y=x+8; when x=0, y=8; additive relationship.**
4	A graph has points (0,0), (1,9), and (5,45). Write the equation and name the relationship.	**y=9x; multiplicative relationship.**
5	Which rule matches this table? x: 0, 1, 6. y: 10, 11, 16. Choose y=10x or y=x+10. Name the relationship.	**y=x+10; additive relationship.**
6	Rule P has graph points (0,0) and (6,30). Rule Q has graph points (0,8) and (6,14). Write an equation for each rule. Then state which rule is multiplicative.	**Rule P: y=5x. Rule Q: y=x+8. Rule P is multiplicative.**

PART 2 · APPLY IT

1. **Plan M: y=9x, and after 5 levels it gives 45 tokens. It is multiplicative. Plan A: y=x+10, and after 5 levels it gives 15 tokens. It is additive.** Let x represent levels finished. Substitute x=5 into each rule, then identify whether the rule multiplies x or adds a starting amount.
2. **Luis: y=x+8, and after 5 days he has 13 stickers. It is additive. Nia: y=6x, and after 5 days she has 30 stickers. It is multiplicative.** Use x for the number of days. Luis has a starting amount plus one per day, while Nia's total is six times the number of days.
3. **P passes through the origin and rises 4 per unit of x; Q starts at y=4 and rises 1 per unit of x. P is multiplicative y=4x; Q is additive y=x+4.** Check all plotted points, straight connections and labels on shared axes. The y-intercepts 0 and 4 and the changes of 4 versus 1 support the learner's actual graphical comparison.

CHALLENGE

6x=x+25, so 5x=25 and x=5. Both rules give y=30 because 6(5)=30 and 5+25=30.

Accept equivalent forms that keep the same rule, such as writing 1x+8 for x+8. For point-based items, students may use the points to justify the equation and relationship type.

Rule Matchup

Shared graph solution: P = y=4x; Q = y=x+4

