LESSON MAKER PRO

Models That Fit

Choose a rule, predict, and check.

GRADE 8 · 8A.AF.K.33

8A.AF.K.33 "Use the mathematical modeling cycle to solve real-world problems involving linear, quadratic, exponential, absolute value, and linear piecewise functions."

NAME _____ DATE _____

MODEL THE SITUATION

Choose a rule that fits how the amount changes. Use the rule to predict a value, then check that the answer makes sense in the situation.

WORKED EXAMPLE

A game booth charges a fixed fee plus a cost per turn. Use the table to find the cost of 8 turns.

GAME BOOTH

Turns	Cost ($)
2	13
5	22

1. (22 - 13)/(5 - 2) = 3 dollars per turn.
2. 13 - 3(2) = 7 dollars for the fixed fee.
3. C = 7 + 3x, so C = 7 + 3(8) = 31.

Answer: $31

PRACTICE 4 problems

1 A bike rental costs $10 plus $4 per hour. Write a cost rule using x hours. Find the cost for 6 hours.

ANSWER _____

2 A square sticker has a side length of x cm. Write an area rule. Find its area when x = 9.

ANSWER _____

3 A post starts with 12 shares. Its shares quadruple each day. Write a rule for its shares after x days. Find the number after 4 days.

ANSWER _____

4 A player's score is x points. Write a rule for its distance from a target of 20 points. Find the distance when x = 16.

ANSWER _____

APPLY IT Show your work

1 A club pays a setup fee to print shirts. The table shows its total cost. Write a cost rule for x shirts, then find the cost of 10 shirts.

SHIRT PRINTING

Shirts	Cost ($)
0	12
4	32

ANSWER _____

2 A music app charges $10 for up to 4 downloads, then $6 for each extra download. Write a cost rule for x downloads. Find the cost of 9 downloads.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Plan A costs $16 plus $4 per game. Plan B costs $28 plus $2 per game. For how many games do they cost the same? Which plan costs less for 9 games? Show how you know.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A bike rental costs $10 plus $4 per hour. Write a cost rule using x hours. Find the cost for 6 hours.	**C = 10 + 4x; $34**
2	A square sticker has a side length of x cm. Write an area rule. Find its area when x = 9.	**$A = x^2$; 81 cm^2**
3	A post starts with 12 shares. Its shares quadruple each day. Write a rule for its shares after x days. Find the number after 4 days.	**$S = 12(4^x)$; 3,072 shares**
4	A player's score is x points. Write a rule for its distance from a target of 20 points. Find the distance when x = 16.	**D = |x - 20|; 4 points**

PART 2 · APPLY IT

1. **C = 12 + 5x; $62** The setup fee is $12. Four shirts add $20, or $5 per shirt, so C = 12 + 5x and C(10) = 62.
2. **C = 10 for 0 <= x <= 4; C = 10 + 6(x - 4) for x > 4; $40** For more than 4 downloads, add $6 for each download beyond 4. Nine downloads cost 10 + 6(9 - 4) = 40 dollars.

CHALLENGE

They cost the same for 6 games: 16 + 4x = 28 + 2x gives x = 6. For 9 games, Plan A costs $52 and Plan B costs $46, so Plan B costs less.

Accept equivalent rules and calculations. In the challenge, the comparison must use costs for 9 games, not just the equal-cost point.