LESSON MAKER PRO

Patterns in Motion

Connect linear stories, tables, graphs, and equations.

HIGH SCHOOL · MT.CORE.ALG.LIN.3.b

MT.CORE.ALG.LIN.3.b "Represent linear functions using tables, graphs, equations, and verbal situations, while using technology strategically. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities by:..."

NAME _____ DATE _____

FIND THE RULE

For a linear pattern, divide the change in y by the change in x to find the slope. Then use a point to find the starting value in y = mx + b.

WORKED EXAMPLE

Use the table to write an equation for y in terms of x.

x	y
17	56
18	59
19	62

1. Slope = (59 - 56)/(18 - 17) = 3.
2. Use (17, 56): 56 = 3(17) + b, so b = 5.

Answer: y = 3x + 5

PRACTICE 4 problems

1 For y = 2x + 9, find y when x = 6.

ANSWER _____

2 A club charges $12 to join and $4 per meeting. Let x be meetings and y be total cost. Write an equation.

ANSWER _____

3 A line passes through (1, 8) and (4, 20). Write its equation.

ANSWER _____

4 For y = -2x + 13, state the starting value and how y changes when x increases by 1.

ANSWER _____

APPLY IT Show your work

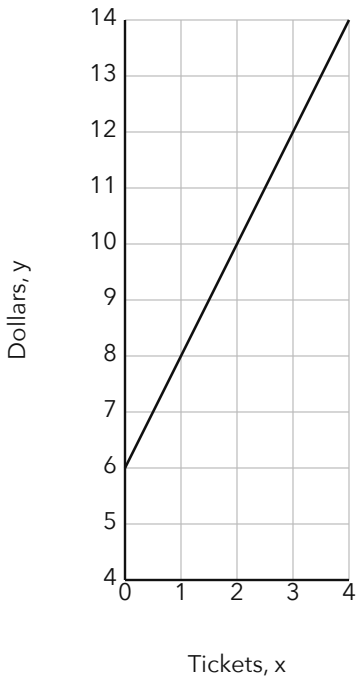
1 At a Salish Kootenai College event, volunteers make flyers. Use the table to write y, total flyers, in terms of hours x. What does the y-intercept mean?

FLYERS MADE

Hours, x	Total flyers, y
0	24
2	32
4	40

ANSWER _____

2 A student group starts with a donation and earns money from ticket sales. The graph shows total dollars y after x tickets. Write the equation and find the total after 7 tickets.



ANSWER _____

CHALLENGE One step up

Two fundraiser plans have totals $y = 6x + 8$ and $y = 2x + 28$. At what x are the totals equal? Check the total using both equations.

WORK SPACE AND ANSWER

Patterns in Motion

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For y = 2x + 9, find y when x = 6.	**21**
2	A club charges $12 to join and $4 per meeting. Let x be meetings and y be total cost. Write an equation.	**y = 4x + 12**
3	A line passes through (1, 8) and (4, 20). Write its equation.	**y = 4x + 4**
4	For y = -2x + 13, state the starting value and how y changes when x increases by 1.	**The starting value is 13. The value of y decreases by 2 when x increases by 1.**

PART 2 · APPLY IT

1. **y = 4x + 24. The volunteers had 24 flyers at the start.** The total rises by 8 flyers in 2 hours, so the rate is 4 flyers per hour. The table shows 24 flyers at x = 0.
2. **y = 2x + 6; $20 after 7 tickets.** The graph crosses the y-axis at 6 and rises $2 per ticket. Substitute x = 7 to get y = 20.

CHALLENGE

x = 5. Both equations give y = 38.

Accept equivalent equations and wording that correctly identifies the starting amount and rate. For the challenge, both totals must equal 38 at x = 5.