LESSON MAKER PRO

# Linear Link Up

*Write equations that connect two changing quantities.*

**HIGH SCHOOL · MA.912.AR.2.2**

**MA.912.AR.2.2** "Write a linear two-variable equation to represent the relationship between two quantities from a graph, a written description or a table of values within a mathematical or real-world context."

NAME _____ DATE _____

## BUILD THE EQUATION

A linear equation can be written as y=mx+b. Find the slope m from the rate of change, then use a point or the y-intercept to find b.

## WORKED EXAMPLE

Use the table to write a linear equation.

**INPUT AND OUTPUT**

| x | y |
|---|---|
| 10 | 1 |
| 20 | 4 |
| 30 | 7 |

1. The change in y is 3 when the change in x is 10, so m=3/10.
2. Use (10, 1): 1=(3/10)(10)+b.
3. 1=3+b, so b=-2.
4. Write y=(3/10)x-2.

**Answer: y=(3/10)x-2**

## PRACTICE 5 problems

**1** A line passes through (2, 5) and (6, 13). Write its equation.

**ANSWER** _____

**2** When x increases by 1, y decreases by 3. The line crosses the y-axis at 8. Write the equation.

**ANSWER** _____

**3** A line passes through (0, -6) and (5, 9). Write its equation.

**ANSWER** _____

**4** A line has slope 5/6 and passes through (6, -1). Write its equation.

**ANSWER** _____

**5** A line passes through (-5, 12) and (3, -4). Write its equation.

**ANSWER** _____

## APPLY IT Show your work

**1** An online game charges a one-time pass fee of $9 and $6 each month. Let x be the number of months and y be the total cost in dollars. Write an equation.

WORK SPACE

**ANSWER** _____

**2** Jordan earns $18 for setting up an event and $5 for each hour worked. Let x be the number of hours and y be Jordan's earnings in dollars. Write an equation.

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

A line passes through (-3, 14), (1, 2), and (5, -10). Write its equation. Then explain in one sentence how you found the y-intercept.

WORK SPACE AND ANSWER

**ANSWER KEY**

# Linear Link Up

**HIGH SCHOOL · MA.912.AR.2.2**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | A line passes through (2, 5) and (6, 13). Write its equation. | **y=2x+1** |
| 2 | When x increases by 1, y decreases by 3. The line crosses the y-axis at 8. Write the equation. | **y=-3x+8** |
| 3 | A line passes through (0, -6) and (5, 9). Write its equation. | **y=3x-6** |
| 4 | A line has slope 5/6 and passes through (6, -1). Write its equation. | **y=(5/6)x-6** |
| 5 | A line passes through (-5, 12) and (3, -4). Write its equation. | **y=-2x+2** |

## PART 2 · APPLY IT

1. **y=6x+9** The monthly charge is the slope, 6. The one-time fee is the y-intercept, 9.
2. **y=5x+18** The hourly pay is the slope, 5. The setup payment is the y-intercept, 18.

## CHALLENGE

**y=-3x+5. The slope is -3, and substituting (1, 2) gives 2=-3(1)+b, so b=5.**

Accept equivalent linear equations in slope-intercept form or standard form. For the challenge, accept any correct explanation that uses the slope and a point to find the y-intercept.