

Model the Situation

Translate real situations into equations and inequalities.

HIGH SCHOOL • AII-A.CED.1

AII-A.CED.1 "Create equations and inequalities in one variable to represent a real-world context."

NAME _____

DATE _____

TURN WORDS INTO MATH

Let x represent the unknown quantity. Use an equation when two amounts are equal. Use an inequality when a situation includes phrases such as at least, no more than, or fewer than.

WORKED EXAMPLE

A movie app charges a \$9 monthly fee and \$4 for each movie rented. The total bill is \$33. Let x be the number of movies. Write an equation.

1. Let x = number of movies rented.
2. The monthly fee is 9, and the movie cost is $4x$.
3. Set the total cost equal to 33: $9 + 4x = 33$.

Answer: $9 + 4x = 33$

PRACTICE 6 problems

- 1** A student buys x notebooks for \$7 each and spends \$56 total. Write an equation.

ANSWER _____

- 2** The temperature is -12 degrees and rises 5 degrees each hour. After x hours, the temperature is 23 degrees. Write an equation.

ANSWER _____

- 3** A gym charges a \$16 sign-up fee and \$2 per visit. You want to spend no more than \$40. Let x be the number of visits. Write an inequality.

ANSWER _____

- 4** You earn \$11 per hour at a job and need to earn at least \$88. Let x be the number of hours worked. Write an inequality.

ANSWER _____

- 5** A rectangular garden has a length of $x + 13$ feet and a width of 6 feet. Its perimeter is 50 feet. Write an equation.

ANSWER _____

- 6** One sibling is x years old, and the other sibling is 8 years younger. Their ages add to 38. Write an equation.

ANSWER _____

APPLY IT Show your work

1

The art club pays \$29 for supplies. It earns \$17 for each sticker pack it sells. The club wants its earnings after paying for supplies to be at least \$165. Let x be the number of sticker packs sold. Write an inequality.

WORK SPACE

ANSWER _____

2

You have \$31 saved for a concert pass. You add \$22 each week and want to have exactly \$185. Let x be the number of weeks you save. Write an equation.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A volunteer already has 25 service points. Each event earns 14 points. To qualify, the volunteer needs a total between 73 and 121 points, inclusive. Let x be the number of events. Write a compound inequality. Then explain in one sentence what each side means.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A student buys x notebooks for \$7 each and spends \$56 total. Write an equation.	$7x = 56$
2	The temperature is -12 degrees and rises 5 degrees each hour. After x hours, the temperature is 23 degrees. Write an equation.	$-12 + 5x = 23$
3	A gym charges a \$16 sign-up fee and \$2 per visit. You want to spend no more than \$40. Let x be the number of visits. Write an inequality.	$16 + 2x \leq 40$
4	You earn \$11 per hour at a job and need to earn at least \$88. Let x be the number of hours worked. Write an inequality.	$11x \geq 88$
5	A rectangular garden has a length of $x + 13$ feet and a width of 6 feet. Its perimeter is 50 feet. Write an equation.	$2(x + 13) + 2(6) = 50$
6	One sibling is x years old, and the other sibling is 8 years younger. Their ages add to 38. Write an equation.	$x + (x - 8) = 38$

PART 2 • APPLY IT

1. $17x - 29 \geq 165$ The club earns $17x$ dollars from sales and subtracts the 29-dollar supply cost. "At least" means the net amount is greater than or equal to 165.
2. $31 + 22x = 185$ Start with 31 dollars, then add 22 dollars for each week. "Exactly" means set the expression equal to 185.

CHALLENGE

$73 \leq 14x + 25 \leq 121$. It means the total is at least 73 points and no more than 121 points.

Accept equivalent equations or inequalities with terms reordered, such as $4x + 9 = 33$. For the challenge, accept two linked inequalities written separately if both bounds are correct and inclusive.