LESSON MAKER PRO

Find the Fit

Model real situations with equations and inequalities.

HIGH SCHOOL · A1P.AF.D.11

A1P.AF.D.11 "Create equations and inequalities in one variable and use them to solve problems in context, either exactly or approximately. Extend from contexts arising from linear functions to those involving quadratic, exponential..."

NAME _____ DATE _____

MODEL, SOLVE, CHECK

Let x stand for the unknown quantity, then write an equation or inequality that matches the situation. Solve it and check whether the result makes sense, especially when time cannot be negative or a count must be a whole number.

WORKED EXAMPLE

A workshop charges a $19 registration fee plus $7 per class. You pay $54 total. How many classes do you take?

1. Write the equation: 19 + 7x = 54.
2. Subtract 19: 7x = 35.
3. Divide by 7: x = 5.

Answer: 5 classes

PRACTICE 6 problems

1 A movie club charges a $9 membership fee plus $3 per movie. You spend $33. Write an equation and find the number x of movies.

ANSWER _____

2 A game subscription costs $11 plus $2 per download. You can spend at most $29. Write an inequality and find the greatest whole number x of downloads you can buy.

ANSWER _____

3 A rectangular gaming mat is x inches wide and x + 2 inches long. Its area is 48 square inches. Write an equation and find its width.

ANSWER _____

4 A foam ball is tossed upward from the ground. Its height in feet after x seconds is $64x - 16x^2$. Write an equation and find when it lands after launch.

ANSWER _____

5 A video has 3 views at the start of a sharing challenge. Its total number of views doubles each round. Write an equation and find the number x of rounds needed to reach 96 views.

ANSWER _____

6 An elevator stops exactly 3 floors away from floor 12. Let x be the floor where it stops. Write an absolute value equation and find both possible floors.

ANSWER _____

APPLY IT Show your work

1 Your school sells dance tickets for $12 each. The DJ costs $180, and decorations cost $36. Write an inequality and find the fewest tickets x the school must sell to earn at least $288 after paying these costs.

WORK SPACE

ANSWER _____

2 A drone launches a foam ball upward from a height of 48 feet. After x seconds, its height in feet is $48 + 32x - 16x^2$. Write an equation and find when the ball reaches the ground.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A concert venue wants attendance to be within 25 people of its goal of 150. Each shuttle brings 20 people, and 30 people arrive on their own. Let x be the number of full shuttles. Write an absolute value inequality and find every whole-number value of x that meets the goal.

WORK SPACE AND ANSWER

Find the Fit

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A movie club charges a $9 membership fee plus $3 per movie. You spend $33. Write an equation and find the number x of movies.	**9 + 3x = 33; x = 8 movies.**
2	A game subscription costs $11 plus $2 per download. You can spend at most $29. Write an inequality and find the greatest whole number x of downloads you can buy.	**11 + 2x ≤ 29; x ≤ 9, so the greatest number is 9 downloads.**
3	A rectangular gaming mat is x inches wide and x + 2 inches long. Its area is 48 square inches. Write an equation and find its width.	**x(x + 2) = 48; x = 6 inches.**
4	A foam ball is tossed upward from the ground. Its height in feet after x seconds is $64x - 16x^2$. Write an equation and find when it lands after launch.	**$64x - 16x^2 = 0$; x = 4 seconds after launch.**
5	A video has 3 views at the start of a sharing challenge. Its total number of views doubles each round. Write an equation and find the number x of rounds needed to reach 96 views.	**$3(2^x) = 96$; x = 5 rounds.**
6	An elevator stops exactly 3 floors away from floor 12. Let x be the floor where it stops. Write an absolute value equation and find both possible floors.	**$\lvert x - 12 \rvert = 3$; x = 9 or x = 15.**

PART 2 · APPLY IT

1. **12x − 180 − 36 ≥ 288; at least 42 tickets.** Solve $12x - 216 \geq 288$ to get $x \geq 42$. Because tickets are sold in whole numbers, the minimum is 42.
2. **$48 + 32x - 16x^2 = 0$; x = 3 seconds.** Divide the equation by −16 to get $x^2 - 2x - 3 = 0$, then factor as $(x - 3)(x + 1) = 0$. Reject $x = -1$ because it is before the launch.

CHALLENGE

$\lvert 20x + 30 - 150 \rvert \leq 25$; 5, 6, or 7 full shuttles.

Accept equivalent equations, inequalities, and simplified forms. For the quadratic time problems, only the time after launch answers the question.