LESSON MAKER PRO

Model the Moment

Write equations and inequalities that fit real situations.

HIGH SCHOOL · A-CED.1

A-CED.1 "Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and exponential functions.*"

NAME _____ DATE _____

CHOOSE THE RELATIONSHIP

Let x stand for the unknown amount. Use an equation for an exact target and an inequality for a limit. Solve, then check that the answer makes sense in the situation.

WORKED EXAMPLE

A service charges a start fee and the same price per visit. Use the table to find how many visits cost $57. Write and solve an equation.

SERVICE COST

Visits	Cost ($)
4	27
5	32

1. Each visit costs $32 - $27 = $5.
2. The start fee is $27 - 4($5) = $7.
3. Write 5x + 7 = 57, then solve: 5x = 50, so x = 10.

Answer: 10 visits

PRACTICE 4 problems

1 A plan costs $8 plus $9 per event. The total is $62. Write an equation for x events and solve.

ANSWER _____

2 A game costs $6 to enter and $3 per round. You have at most $24. Write and solve an inequality for x rounds.

ANSWER _____

3 A rectangle is x units wide and x + 3 units long. Its area is 54 square units. Write an equation and find its width.

ANSWER _____

4 A game score starts at 6 and triples each level. At level x, the score is 162. Write and solve an equation.

ANSWER _____

APPLY IT Show your work

1 In a game, a character's height is $h = -x^2 + 8x + 2$ meters after x seconds. When is the character 14 meters high? Write an equation and solve.

WORK SPACE

ANSWER _____

2 A clip has 25 views. Its views triple each day. After how many days will it have 675 views? Write and solve an equation.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A garden is x meters wide and x + 8 meters long. You have enough soil for at most 84 square meters. Write an inequality and find the greatest whole-number width.

WORK SPACE AND ANSWER

ANSWER KEY

Model the Moment

HIGH SCHOOL · A-CED.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A plan costs $8 plus $9 per event. The total is $62. Write an equation for x events and solve.	**8 + 9x = 62; x = 6 events**
2	A game costs $6 to enter and $3 per round. You have at most $24. Write and solve an inequality for x rounds.	**6 + 3x <= 24; x <= 6, so at most 6 rounds**
3	A rectangle is x units wide and x + 3 units long. Its area is 54 square units. Write an equation and find its width.	**x(x + 3) = 54; x = 6 units**
4	A game score starts at 6 and triples each level. At level x, the score is 162. Write and solve an equation.	**$6(3^x) = 162$; x = 3**

PART 2 · APPLY IT

1. **$-x^2 + 8x + 2 = 14$; x = 2 or x = 6 seconds** Rearrange to $x^2 - 8x + 12 = 0$. Factor as $(x - 2)(x - 6) = 0$.
2. **$25(3^x) = 675$; x = 3 days** Divide by 25 to get $3^x = 27$. Since $3^3 = 27$, x = 3.

CHALLENGE

x(x + 8) <= 84; the greatest whole-number width is 6 meters.

Accept equivalent equations and inequalities. For the rectangle and garden, reject negative widths; the challenge inequality holds for widths from 0 through 6 meters.