

Equation Quest

Model quantities, then solve for x .

GRADE 7 • NY-7.EE.4

NY-7.EE.4 "Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities."

NAME _____

DATE _____

MODEL AND SOLVE

Use x for the unknown quantity. Write an equation when two amounts are equal, and write an inequality when an amount has a limit, such as at least or no more than. Undo operations in reverse order to isolate x .

WORKED EXAMPLE

Solve $4x + 9 = 33$.

1. Subtract 9 from both sides: $4x = 24$.

2. Divide both sides by 4: $x = 6$.

Answer: $x = 6$

PRACTICE 6 problems

1 Solve: $3x - 8 = 16$

ANSWER _____

2 Solve: $x/5 + 2 = 7$

ANSWER _____

3 Solve: $2(x + 3) = 22$

ANSWER _____

4 Solve: $23 - 2x = 3$

ANSWER _____

5 Solve: $2x + 3 \geq 17$

ANSWER _____

6 A number decreased by 12 is 20. Write an equation and solve it.

ANSWER _____

APPLY IT Show your work

- 1** Maya has \$26 saved for a concert. She saves \$3 each week. How many weeks, x , will it take her to have \$41? Write and solve an equation.

WORK SPACE

ANSWER _____

- 2** You have \$27 for an arcade visit. Admission costs \$5, and each game token costs \$2. Write and solve an inequality for the number of tokens, x , you can buy. What is the greatest whole number of tokens you can buy?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A robotics team has \$61. Each kit costs \$7, and shipping costs \$12. Write and solve an inequality for the number of kits, x , the team can buy. Can the team buy 8 kits? Explain your reasoning.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve: $3x - 8 = 16$	$x = 8$
2	Solve: $x/5 + 2 = 7$	$x = 25$
3	Solve: $2(x + 3) = 22$	$x = 8$
4	Solve: $23 - 2x = 3$	$x = 10$
5	Solve: $2x + 3 \geq 17$	$x \geq 7$
6	A number decreased by 12 is 20. Write an equation and solve it.	$x - 12 = 20$; $x = 32$

PART 2 • APPLY IT

- $26 + 3x = 41$; $x = 5$ weeks** Subtract 26 to get $3x = 15$. Divide by 3, so Maya needs 5 weeks.
- $5 + 2x \leq 27$; $x \leq 11$; greatest whole number: 11 tokens** Subtract 5 to get $2x \leq 22$. Divide by 2, so $x \leq 11$.

CHALLENGE

$7x + 12 \leq 61$; $x \leq 7$. No. Eight kits would cost \$68, which is more than \$61.

Accept equivalent equations and inequalities that use x and correctly represent the situation. For whole-item contexts, accept the greatest whole number that satisfies the inequality.