

Model It Out

Use equations and inequalities to make sense of real situations.

GRADE 8 • 8.PAR.3

8.PAR.3 "Create and interpret expressions within relevant situations. Create, interpret, and solve linear equations and linear inequalities in one variable to model and explain real phenomena."

NAME _____

DATE _____

BUILD, SOLVE, INTERPRET

Use x for an unknown amount. Write an equation when two amounts are equal, and write an inequality when a situation has a limit such as at most or no more than. Solve by undoing operations in reverse order, then check that your answer fits the situation.

WORKED EXAMPLE

Solve: $4x + 11 = 35$

1. Subtract 11 from both sides: $4x = 24$
2. Divide both sides by 4: $x = 6$
3. Check: $4(6) + 11 = 35$

Answer: $x = 6$

PRACTICE 6 problems

1 Solve: $9x + 2 = 47$

ANSWER _____

2 Solve: $12 - 3x = -9$

ANSWER _____

3 Solve: $5x - 2 \leq 38$

ANSWER _____

4 A club charges a \$13 joining fee and \$5 per meeting. Its total cost is $13 + 5x$. What does $5x$ represent?

ANSWER _____

5 A player has 17 points and earns 3 points for each win. Write and solve an equation to find how many wins are needed to reach 32 points.

ANSWER _____

6 Tickets cost \$7 each. You have \$52. Write an inequality, then find the greatest number of tickets you can buy.

ANSWER _____

APPLY IT Show your work

- 1** You want headphones that cost \$63. You already have \$18 and save \$9 each week. Write and solve an equation to find how many weeks you need to save.

WORK SPACE

ANSWER _____

- 2** A streaming service costs \$10 each month. You have \$59 to spend. Write and solve an inequality to find the greatest number of whole months you can pay for.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

An art club has \$93. It buys a \$13 banner and art kits that cost \$8 each. How many kits can it buy? Write an inequality and explain why your answer is the greatest possible whole number.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve: $9x + 2 = 47$	$x = 5$
2	Solve: $12 - 3x = -9$	$x = 7$
3	Solve: $5x - 2 \leq 38$	$x \leq 8$
4	A club charges a \$13 joining fee and \$5 per meeting. Its total cost is $13 + 5x$. What does $5x$ represent?	The cost of x meetings at \$5 per meeting.
5	A player has 17 points and earns 3 points for each win. Write and solve an equation to find how many wins are needed to reach 32 points.	$17 + 3x = 32$; $x = 5$ wins
6	Tickets cost \$7 each. You have \$52. Write an inequality, then find the greatest number of tickets you can buy.	$7x \leq 52$; 7 tickets

PART 2 • APPLY IT

- 5 weeks** Set $18 + 9x = 63$. Subtract 18, then divide by 9 to get $x = 5$.
- 5 months** Write $10x \leq 59$. Dividing by 10 gives $x \leq 5.9$, so the greatest whole number of months is 5.

CHALLENGE

10 kits; $13 + 8x \leq 93$, so $x \leq 10$. The next whole number would cost more than \$93.

Accept equivalent equations and inequalities that correctly model each situation. For ticket, month, and kit questions, accept only whole-number answers that do not exceed the stated budget.