

Equation Decoder

Turn situation clues into two-step equations.

GRADE 7 • 7.PFA.3.d

7.PFA.3.d "Write a two-step linear equation in one variable to represent a verbal situation, including those in context."

NAME _____

DATE _____

BUILD THE EQUATION

Let x stand for the unknown amount. Use multiplication for an amount that repeats, then add or subtract a starting amount, fee, or change. Set the expression equal to the total or amount left.

WORKED EXAMPLE

A game pass has a \$12 fee plus \$7 for each visit. The total cost is \$47. Write a two-step equation.

1. Let x = the number of visits.
2. The visit cost is $7x$.
3. Add the fee: $7x + 12$.
4. Set the cost equal to the total: $7x + 12 = 47$.

Answer: $7x + 12 = 47$

PRACTICE 6 problems

- 1** You begin with 7 stickers and earn 5 stickers for each chore. You have 32 stickers. Write a two-step equation. Let x = the number of chores.

ANSWER _____

- 2** A park charges \$6 to enter and \$2 for each ride. Your total cost is \$18. Write a two-step equation. Let x = the number of rides.

ANSWER _____

- 3** A tank began with 73 liters of water. It drains 8 liters each minute and has 41 liters left. Write a two-step equation. Let x = the number of minutes.

ANSWER _____

- 4** You have a \$54 balance. After making x payments of \$9 each, your balance is \$18. Write a two-step equation.

ANSWER _____

- 5** Each notebook costs \$4. A coupon takes \$5 off your purchase, and you pay \$19. Write a two-step equation. Let x = the number of notebooks.

ANSWER _____

- 6** A team scores 11 points before earning 6 points in each round. The team has 35 points. Write a two-step equation. Let x = the number of rounds.

ANSWER _____

APPLY IT Show your work

- 1** The school gaming club rents a room for \$8 and pays \$5 for each hour it uses the room. The club spends \$38. Write a two-step equation. Let x = the number of hours.

WORK SPACE

ANSWER _____

- 2** You have \$64 on a gift card. You buy x comic books for \$6 each and have \$22 left. Write a two-step equation.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Mina says, "I had 50 points, lost 4 points each round, and ended with 26 points," can be represented by $4x + 50 = 26$. Is Mina correct? Write the correct equation and explain why.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	You begin with 7 stickers and earn 5 stickers for each chore. You have 32 stickers. Write a two-step equation. Let x = the number of chores.	$5x + 7 = 32$
2	A park charges \$6 to enter and \$2 for each ride. Your total cost is \$18. Write a two-step equation. Let x = the number of rides.	$2x + 6 = 18$
3	A tank began with 73 liters of water. It drains 8 liters each minute and has 41 liters left. Write a two-step equation. Let x = the number of minutes.	$73 - 8x = 41$
4	You have a \$54 balance. After making x payments of \$9 each, your balance is \$18. Write a two-step equation.	$54 - 9x = 18$
5	Each notebook costs \$4. A coupon takes \$5 off your purchase, and you pay \$19. Write a two-step equation. Let x = the number of notebooks.	$4x - 5 = 19$
6	A team scores 11 points before earning 6 points in each round. The team has 35 points. Write a two-step equation. Let x = the number of rounds.	$6x + 11 = 35$

PART 2 • APPLY IT

1. $5x + 8 = 38$ The hourly cost is $5x$. Add the \$8 room fee and set the expression equal to \$38.
2. $64 - 6x = 22$ The comic books cost $6x$. Subtract that cost from the starting balance of \$64 to show the \$22 remaining.

CHALLENGE

No. 50 - $4x = 26$, because 4 points are lost each round, so $4x$ is subtracted from 50.

Accept equivalent equations with the two sides reversed or terms reordered, such as $32 = 5x + 7$. Students should define x consistently as the unknown quantity named in each situation.