

Show Your Math

Solve equations and justify each solution clearly.

GRADE 8 • TEKS 8.1.G

8.1.G "display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication."

NAME _____

DATE _____

BUILD A CLEAR ARGUMENT

To make a solution clear, write the original equation, use inverse operations on both sides, and state the value of x . Check by substituting the value into the original equation, then use the matching results to justify that the value is a solution.

WORKED EXAMPLE

Solve $5(x + 7) = 60$. Then write a check.

1. Divide both sides by 5: $x + 7 = 12$.
2. Subtract 7 from both sides: $x = 5$.
3. Check: $5(5 + 7) = 60$, so $60 = 60$.

Answer: $x = 5$; the equation checks.

PRACTICE 6 problems

- 1** Solve $3x + 8 = 35$. Show inverse operations and write a check using substitution.

ANSWER _____

- 2** Solve $4(x - 2) = 32$. Show inverse operations and write a check using substitution.

ANSWER _____

- 3** Solve $x/3 + 9 = 15$. Show inverse operations and write a check using substitution.

ANSWER _____

- 4** Solve $8 - 2x = -10$. Show inverse operations and write a check using substitution.

ANSWER _____

- 5** Solve $11(x + 1) = 44$. Show inverse operations and write a check using substitution.

ANSWER _____

- 6** Solve $2(3x - 4) = 40$. Show inverse operations and write a check using substitution.

ANSWER _____

APPLY IT Show your work

- 1** An online game store charges \$14 for a controller case and \$3 for each sticker pack. Maya spent \$38. How many sticker packs did she buy? Write an equation, solve it, and explain in one sentence why your answer makes sense.

WORK SPACE

ANSWER _____

- 2** At an esports club, a team earns 6 points for each win and loses 2 points for each penalty. The team has 32 points after 8 penalties. How many wins did the team have? Write an equation and explain in one sentence how inverse operations find the answer.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Jordan says $x = 4$ solves $4(2x + 3) + 1 = 37$ because $4(2(4) + 3) + 1 = 37$. Is Jordan correct? Solve the equation and write two sentences that justify your conclusion.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve $3x + 8 = 35$. Show inverse operations and write a check using substitution.	$x = 9$; check: $3(9) + 8 = 35$, so $35 = 35$.
2	Solve $4(x - 2) = 32$. Show inverse operations and write a check using substitution.	$x = 10$; check: $4(10 - 2) = 32$, so $32 = 32$.
3	Solve $x/3 + 9 = 15$. Show inverse operations and write a check using substitution.	$x = 18$; check: $18/3 + 9 = 15$, so $15 = 15$.
4	Solve $8 - 2x = -10$. Show inverse operations and write a check using substitution.	$x = 9$; check: $8 - 2(9) = -10$, so $-10 = -10$.
5	Solve $11(x + 1) = 44$. Show inverse operations and write a check using substitution.	$x = 3$; check: $11(3 + 1) = 44$, so $44 = 44$.
6	Solve $2(3x - 4) = 40$. Show inverse operations and write a check using substitution.	$x = 8$; check: $2(3(8) - 4) = 40$, so $40 = 40$.

PART 2 • APPLY IT

- $14 + 3x = 38$; $x = 8$.** Eight sticker packs make sense because $14 + 3(8) = 38$. Subtract 14 from both sides, then divide by 3. The substitution check shows that 8 packs give a total of \$38.
- $6x - 2(8) = 32$; $x = 8$.** Adding 16 to each side gives 48, and dividing by 6 gives 8 wins. Add 16 to both sides to undo the penalty points, then divide by 6. The team had 8 wins.

CHALLENGE

$4(2x + 3) + 1 = 37$; $8x + 13 = 37$; $8x = 24$; $x = 3$. Jordan is not correct because substituting 4 gives 45, not 37. Substituting 3 gives 37, so $x = 3$ is the solution.

Accept equivalent equation-solving steps when operations are applied correctly to both sides. For explanations, accept precise statements that include a valid substitution check or correctly describe the inverse operations used.