

Balance and Solve

Use inverse operations to find x .

GRADE 8 • MA.8.AR.2

MA.8.AR.2 "Solve multi-step one-variable equations and inequalities."

NAME _____

DATE _____

KEEP BOTH SIDES EQUAL

Undo operations in the reverse order they were done. Do the same operation to both sides of an equation or inequality. If you multiply or divide an inequality by a negative number, reverse the inequality sign.

WORKED EXAMPLE

$$5x - 7 = 28$$

1. Add 7 to both sides: $5x = 35$.

2. Divide both sides by 5: $x = 7$.

3. Check: $5(7) - 7 = 28$.

Answer: $x = 7$

PRACTICE 6 problems

1 $3x + 8 = 26$

ANSWER _____

2 $4(x - 2) = 36$

ANSWER _____

3 $(2/3)x + 9 = 19$

ANSWER _____

4 $6 - 3x = -21$

ANSWER _____

5 $2x + 13 > 31$

ANSWER _____

6 $18 - 4x \leq -6$

ANSWER _____

APPLY IT Show your work

- 1** A music app charges a \$4 setup fee and \$3 per month. Maya can spend at most \$22 and will subscribe for a whole number of months. What is the greatest number of months she can subscribe?

WORK SPACE

ANSWER _____

- 2** An online shop charges \$12 for shipping and \$2 for each custom controller skin. Jordan's total cost is \$42. How many controller skins did Jordan order?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve the inequality: $4(2x - 3) - 1 > 2(x + 4) + 3$

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	$3x + 8 = 26$	$x = 6$
2	$4(x - 2) = 36$	$x = 11$
3	$(2/3)x + 9 = 19$	$x = 15$
4	$6 - 3x = -21$	$x = 9$
5	$2x + 13 > 31$	$x > 9$
6	$18 - 4x \leq -6$	$x \geq 6$

PART 2 • APPLY IT

- 6 months** Write $4 + 3x \leq 22$. Subtract 4, then divide by 3 to get $x \leq 6$, so the greatest whole number is 6.
- 15 controller skins** Write $12 + 2x = 42$. Subtract 12, then divide by 2 to get $x = 15$.

CHALLENGE

$x > 4$

Accept equivalent solution forms, including inequalities written with the variable on either side. For the first word problem, accept $x \leq 6$ before the student states the maximum whole number of months.