

Equation Escape Route

Undo operations to find the unknown.

GRADE 7 • 7.EE.B.4a

CCSS.Math.Content.7.EE.B.4a "Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution..."

NAME _____

DATE _____

UNDO IN REVERSE ORDER

To solve $px + q = r$, undo q first, then undo multiplication by p .
To solve $p(x + q) = r$, divide by p first, then undo q . Check by putting your answer into the original equation.

WORKED EXAMPLE

Solve: $13(x + 12) = 91$

1. Divide both sides by 13: $x + 12 = 7$
2. Subtract 12 from both sides: $x = -5$
3. Check: $13(-5 + 12) = 13(7) = 91$

Answer: $x = -5$

PRACTICE 6 problems

1 Solve: $5x + 8 = 33$

ANSWER _____

2 Solve: $-4x + 6 = -18$

ANSWER _____

3 Solve: $(1/2)x - 3 = 5$

ANSWER _____

4 Solve: $3(x + 4) = 27$

ANSWER _____

5 Solve: $-5(x - 6) = -20$

ANSWER _____

6 Solve: $(3/4)(x + 4) = 15$

ANSWER _____

APPLY IT Show your work

- 1** A music app charges a one-time \$4 setup fee and \$3 for each month. Jordan paid \$22 total. How many months did Jordan pay for?

WORK SPACE

ANSWER _____

- 2** Four friends each buy a ticket to a school esports event. Each ticket costs x dollars plus a \$5 service fee. Together, they pay \$44. What is the ticket price before the service fee?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A gaming club has 6 players. Each player pays x dollars for a tournament entry and \$2 for a badge. The total is \$42. Find x . Then write one sentence comparing the operation sequence in an algebraic solution and an arithmetic solution.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve: $5x + 8 = 33$	$x = 5$
2	Solve: $-4x + 6 = -18$	$x = 6$
3	Solve: $(1/2)x - 3 = 5$	$x = 16$
4	Solve: $3(x + 4) = 27$	$x = 5$
5	Solve: $-5(x - 6) = -20$	$x = 10$
6	Solve: $(3/4)(x + 4) = 15$	$x = 16$

PART 2 • APPLY IT

- 6 months** Let m be the number of months. Solve $3m + 4 = 22$, so $3m = 18$ and $m = 6$.
- \$6** Write $4(x + 5) = 44$. Divide by 4 to get $x + 5 = 11$, then subtract 5.

CHALLENGE

$x = 5$. Algebraically, divide 42 by 6 and subtract 2, while arithmetically, share \$42 among 6 players and then remove the \$2 badge cost.

Accept equivalent equation-solving steps and correct answers with appropriate units. For the challenge, accept a comparison that identifies dividing the total among players first and subtracting the added cost second.