LESSON MAKER PRO

Find the Unknown

Write, solve, and check equations with rational numbers.

GRADE 7 · MT.7.EE.3

MT.7.EE.3 "Write and solve one- and two-step equations including problems in context with rational numbers, convert between forms as appropriate, and assess the reasonableness of answers."

NAME _____ DATE _____

UNDO TO SOLVE

To solve an equation, undo addition or subtraction first, then undo multiplication or division. Do the same thing to both sides, and substitute your answer to check it. For a story problem, decide what x means before you write the equation.

WORKED EXAMPLE

Solve 0.4x + 1.3 = 3.7.

1. Subtract 1.3 from both sides: 0.4x = 3.7 - 1.3.
2. Simplify: 0.4x = 2.4.
3. Divide both sides by 0.4: x = 2.4 / 0.4.
4. Simplify: x = 6.

Answer: x = 6

PRACTICE 6 problems

1 Solve for x: x + 2/3 = 5/6.

ANSWER _____

2 Solve for x: x - 1.25 = -0.5.

ANSWER _____

3 Solve for x: (-3/4)x = 9/8.

ANSWER _____

4 Solve for x: x/5 + 0.2 = 1.1.

ANSWER _____

5 Solve for x: 1.5x - 2 = -0.5.

ANSWER _____

6 Solve for x: -0.2x + 1/2 = 1/10.

ANSWER _____

APPLY IT Show your work

1 You have $8.50 in game credit. After buying 3 identical avatar items, you have $2.35 left. Let x be the price of one item. Write and solve an equation for x. Check that your price leaves the right amount of credit.

WORK SPACE

ANSWER _____

2 A quiz game starts your score at -2.5 points because of a penalty. Each of 5 correct answers earns x points. Your final score is 8.75 points. Write and solve an equation for x. Check that your answer gives the final score.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two music club plans cost the same amount for x songs. Plan A costs $2.50 plus $1.25 per song. Plan B costs $5.00 plus $0.75 per song. Write and solve an equation to find x. Check your answer by finding the cost of each plan.

WORK SPACE AND ANSWER

ANSWER KEY

Find the Unknown

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve for x: x + 2/3 = 5/6.	**x = 1/6**
2	Solve for x: x - 1.25 = -0.5.	**x = 0.75**
3	Solve for x: (-3/4)x = 9/8.	**x = -3/2**
4	Solve for x: x/5 + 0.2 = 1.1.	**x = 4.5**
5	Solve for x: 1.5x - 2 = -0.5.	**x = 1**
6	Solve for x: -0.2x + 1/2 = 1/10.	**x = 2**

PART 2 · APPLY IT

1. **8.50 - 3x = 2.35; x = $2.05. Check: $8.50 - 3($2.05) = $2.35.** The three items cost $8.50 - $2.35 = $6.15. Divide by 3 to find the price of one item.
2. **-2.5 + 5x = 8.75; x = 2.25 points. Check: -2.5 + 5(2.25) = 8.75.** Add 2.5 to both sides to get 5x = 11.25, then divide by 5. Substitution confirms the final score.

CHALLENGE

2.50 + 1.25x = 5.00 + 0.75x; x = 5 songs. Plan A costs $2.50 + $1.25(5) = $8.75, and Plan B costs $5.00 + $0.75(5) = $8.75.

Accept equivalent fraction or decimal forms for exact answers, such as -1.5 for -3/2. In context problems, the equation, solution, and check should agree with the stated quantities.