LESSON MAKER PRO

Equation Escape Route

Solve step by step until x is alone.

GRADE 8 · MA.8.AR.2.1

MA.8.AR.2.1 "Solve multi-step linear equations in one variable, with rational number coefficients. Include equations with variables on both sides."

NAME _____ DATE _____

KEEP BOTH SIDES BALANCED

Simplify each side first, then use inverse operations to get x alone. When x appears on both sides, move all x-terms to one side before solving. Check by substituting your value into the original equation.

WORKED EXAMPLE

Solve: 7/10x + 3 = 1/5x + 11

1. Subtract 1/5x from both sides: 1/2x + 3 = 11.
2. Subtract 3 from both sides: 1/2x = 8.
3. Multiply both sides by 2: x = 16.

Answer: x = 16

PRACTICE 6 problems

1 Solve: 4x - 12 = 2x + 18

ANSWER _____

2 Solve: 3/8x + 14 = 1/8x + 23

ANSWER _____

3 Solve: 27 - 2x = 6x - 37

ANSWER _____

4 Solve: -3/4x + 19 = 1/2x - 6

ANSWER _____

5 Solve: 8(x - 3) = 2x + 30

ANSWER _____

6 Solve: 2/3x - 7 = 1/6x + 8

ANSWER _____

APPLY IT Show your work

1 A music app offers two download plans. Plan A charges a $6 monthly fee plus $1/4 for each song download. Plan B charges a $12 monthly fee plus $1/10 for each song download. How many downloads make the plans cost the same?

WORK SPACE

ANSWER _____

2 Two video editing apps have student plans. Plan A costs a $9 starting fee plus $3/4 per month. Plan B costs a $24 starting fee plus $1/4 per month. After how many months will the plans cost the same?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve: 2/3(3x - 9) - 4 = 1/2(x + 8) + x. Then write one sentence explaining why expanding before combining x-terms is useful.

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ANSWER KEY

Equation Escape Route

GRADE 8 · MA.8.AR.2.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve: 4x - 12 = 2x + 18	**x = 15**
2	Solve: 3/8x + 14 = 1/8x + 23	**x = 36**
3	Solve: 27 - 2x = 6x - 37	**x = 8**
4	Solve: -3/4x + 19 = 1/2x - 6	**x = 20**
5	Solve: 8(x - 3) = 2x + 30	**x = 9**
6	Solve: 2/3x - 7 = 1/6x + 8	**x = 30**

PART 2 · APPLY IT

1. **40 downloads** Let x be the number of downloads. Solve 1/4x + 6 = 1/10x + 12 to get x = 40.
2. **30 months** Let x be the number of months. Solve 3/4x + 9 = 1/4x + 24 to get x = 30.

CHALLENGE

x = 28. Expanding first shows the coefficient of each x-term so like terms can be combined correctly.

Accept equivalent solution notation, such as 15 for x = 15. For the challenge, accept any accurate one-sentence explanation that states that expanding reveals terms that can be combined.