LESSON MAKER PRO

What Does x Do?

Solve each equation and see what its final line means.

GRADE 8 · MT.8.EE.7

MT.8.EE.7 "Solve linear equations in one variable by: Giving examples of linear equations in one variable with one solution, infinitely many solutions..."

NAME _____ DATE _____

THREE POSSIBLE RESULTS

Distribute and combine like terms, then make the same move on both sides of the equation. A final line of x = a gives one solution. A true number statement means every value of x works, while a false number statement means none works.

WORKED EXAMPLE

Solve $3/4(x - 8) = 1/4x + 5$.

1. Distribute: 3/4x - 6 = 1/4x + 5
2. Subtract 1/4x from both sides: 1/2x - 6 = 5
3. Add 6 to both sides: 1/2x = 11
4. Multiply both sides by 2: x = 22

Answer: x = 22

PRACTICE 6 problems

1 Solve: x/2 + 7 = 12.

ANSWER _____

2 Solve: 2/9(x + 18) = 10.

ANSWER _____

3 Solve: 0.25(x + 12) = 0.75x - 9.

ANSWER _____

4 Solve or state how many solutions there are. Show the final number statement: 2(x + 7) = 2x + 14.

ANSWER _____

5 Solve or state how many solutions there are. Show the final number statement: 9(x - 2) = 9x - 12.

ANSWER _____

6 Solve: (x - 10)/2 + x/3 = 0.

ANSWER _____

APPLY IT Show your work

1 One game pass costs $9 up front plus $2 per month. Another costs $24 up front plus $0.50 per month. After how many months will the total costs be equal? Write and solve an equation.

WORK SPACE

ANSWER _____

2 For a group order of keychains, Shop A charges a $15 setup fee plus $0.75 per keychain. Shop B charges a $9 setup fee plus $1.25 per keychain. How many keychains make the total costs equal? Write and solve an equation.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student says 0.2(x + 15) + 0.3x = 0.5x + 7 has one solution. Is the student correct? Show steps to a final number statement and explain what it means.

WORK SPACE AND ANSWER

ANSWER KEY

What Does x Do?

GRADE 8 · MT.8.EE.7

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve: x/2 + 7 = 12.	**x = 10**
2	Solve: 2/9(x + 18) = 10.	**x = 27**
3	Solve: 0.25(x + 12) = 0.75x - 9.	**x = 24**
4	Solve or state how many solutions there are. Show the final number statement: 2(x + 7) = 2x + 14.	**14 = 14; infinitely many solutions.**
5	Solve or state how many solutions there are. Show the final number statement: 9(x - 2) = 9x - 12.	**-18 = -12; no solutions.**
6	Solve: (x - 10)/2 + x/3 = 0.	**x = 6**

PART 2 · APPLY IT

1. **10 months** Set the costs equal: 9 + 2x = 24 + 0.50x. Then 1.50x = 15, so x = 10.
2. **12 keychains** Set the costs equal: 15 + 0.75x = 9 + 1.25x. Then 6 = 0.50x, so x = 12.

CHALLENGE

No. Distributing and combining like terms gives 0.5x + 3 = 0.5x + 7. Subtracting 0.5x gives 3 = 7, which is false, so there are no solutions.

Accept equivalent true or false number statements for problems 4 and 5. For the word problems, x represents months and keychains, respectively.