

Unit 4 Lesson 13: More Balanced Moves

1 Different Equations? (Warm up)

Student Task Statement

Equation 1

$$x - 3 = 2 - 4x$$

Which of these have the same solution as Equation 1? Be prepared to explain your reasoning.

Equation A

$$2x - 6 = 4 - 8x$$

Equation B

$$x - 5 = -4x$$

Equation C

$$2(1 - 2x) = x - 3$$

Equation D

$$-3 = 2 - 5x$$

2 Step by Step by Step by Step

Student Task Statement

Here is an equation, and then all the steps Clare wrote to solve it:

$$\begin{aligned}14x - 2x + 3 &= 3(5x + 9) \\12x + 3 &= 3(5x + 9) \\3(4x + 1) &= 3(5x + 9) \\4x + 1 &= 5x + 9 \\1 &= x + 9 \\-8 &= x\end{aligned}$$

Here is the same equation, and the steps Lin wrote to solve it:

$$\begin{aligned}14x - 2x + 3 &= 3(5x + 9) \\12x + 3 &= 3(5x + 9) \\12x + 3 &= 15x + 27 \\12x &= 15x + 24 \\-3x &= 24 \\x &= -8\end{aligned}$$

1. Are both of their *solutions* correct? Explain your reasoning.
2. Describe some ways the steps they took are alike and different.

3. Mai and Noah also solved the equation, but some of their steps have errors. Find the incorrect step in each solution and explain why it is incorrect.

Mai:

$$14x - 2x + 3 = 3(5x + 9)$$

$$12x + 3 = 3(5x + 9)$$

$$7x + 3 = 3(9)$$

$$7x + 3 = 27$$

$$7x = 24$$

$$x = \frac{24}{7}$$

Noah:

$$14x - 2x + 3 = 3(5x + 9)$$

$$12x + 3 = 15x + 27$$

$$27x + 3 = 27$$

$$27x = 24$$

$$x = \frac{24}{27}$$

3 Make Your Own Steps

Student Task Statement

Solve these equations for x .

1. $\frac{12+6x}{3} = \frac{5-9}{2}$

2. $x - 4 = \frac{1}{3}(6x - 54)$

3. $-(3x - 12) = 9x - 4$

4 Trading Moves

Student Task Statement

Your teacher will give you 4 cards, each with an equation.

1. With your partner, select a card and choose who will take the first turn.
2. During your turn, decide what the next move to solve the equation should be, explain your choice to your partner, and then write it down once you both agree. Switch roles for the next move. This continues until the equation is solved.
3. Choose a second equation to solve in the same way, trading the card back and forth after each move.
4. For the last two equations, choose one each to solve and then trade with your partner when you finish to check one another's work.