

Unit 3 Lesson 10: Different Options for Solving One Equation

1 Algebra Talk: Solve Each Equation (Warm up)

Student Task Statement

$$100(x - 3) = 1,000$$

$$500(x - 3) = 5,000$$

$$0.03(x - 3) = 0.3$$

$$0.72(x + 2) = 7.2$$

2 Analyzing Solution Methods

Student Task Statement

Three students each attempted to solve the equation $2(x - 9) = 10$, but got different solutions. Here are their methods. Do you agree with any of their methods, and why?

Noah's method:

$$\begin{aligned}2(x - 9) &= 10 \\2(x - 9) + 9 &= 10 + 9 && \text{add 9 to each side} \\2x &= 19 \\2x \div 2 &= 19 \div 2 && \text{divide each side by 2} \\x &= \frac{19}{2}\end{aligned}$$

Elena's method:

$$\begin{aligned}2(x - 9) &= 10 \\2x - 18 &= 10 && \text{apply the distributive property} \\2x - 18 - 18 &= 10 - 18 && \text{subtract 18 from each side} \\2x &= -8 \\2x \div 2 &= -8 \div 2 && \text{divide each side by 2} \\x &= -4\end{aligned}$$

Andre's method:

$$\begin{aligned}2(x - 9) &= 10 \\2x - 18 &= 10 && \text{apply the distributive property} \\2x - 18 + 18 &= 10 + 18 && \text{add 18 to each side} \\2x &= 28 \\2x \div 2 &= 28 \div 2 && \text{divide each side by 2} \\x &= 14\end{aligned}$$

3 Solution Pathways

Student Task Statement

For each equation, try to solve the equation using each method (dividing each side first, or applying the distributive property first). Some equations are easier to solve by one method than the other.

When that is the case, stop doing the harder method and write down the reason you stopped.

1. $2,000(x - 0.03) = 6,000$

2. $2(x + 1.25) = 3.5$

3. $\frac{1}{4}(4 + x) = \frac{4}{3}$

4. $-10(x - 1.7) = -3$

5. $5.4 = 0.3(x + 8)$