

Objective 16

Identify the property that justifies a step when solving a linear equation

Solve for x and justify each step with a reason: $3(x - 2) + 5x = 9x - 24$

| Steps: | Justification (Reasons): |
|------------------------------|--|
| $3(x - 2) + 5x = 9x - 24$ | Given |
| $3x - 6 + 5x = 9x - 24$ | Distributive Property |
| $3x + 5x - 6 = 9x - 24$ | Commutative Property of Addition |
| $8x - 6 = 9x - 24$ | Combine Like Terms |
| $8x - 8x - 6 = 9x - 8x - 24$ | Subtraction Property of Equality |
| $0 - 6 = x - 24$ | Additive Inverse Property (left) Combine Like Terms (right) |
| $-6 = x - 24$ | Additive Identity Property |
| $-6 + 24 = x - 24 + 24$ | Addition Property of Equality |
| $18 = x + 0$ | Addition (left) Additive Inverse Property (right) |
| $18 = x$ | Additive Identity Property |

Guided Practice:

1. Which property provides justification for Step 4?

- $\frac{4}{4}x - 7 = \frac{5}{4}x$ Given
- $-7 = \frac{1}{4}x$ Addition property of equality
- $\frac{1}{4}x = -7$ Reflexive property of equality
- $x = -28$?

[A] Addition property of equality

[B] Reflexive property of equality

[C] Multiplication property of equality

[D] Distributive property of multiplication

2. Fill in the blank with the justification for Step 4.

- $3x - 1 = 5(x + 3)$ Given
- $3x - 1 = 5x + 15$ Distributive property of multiplication
- $3x = 5x + 16$ Addition property of equality
- $-2x = 16$ _____

3. Which property justifies this step in solving for m ?

Equation: $(m+4) - 9 = 14$

Step: $m + (4 - 9) = 14$

- [A] Associative property of multiplication [B] Distributive property of multiplication
[C] Associative property of addition [D] Subtraction property of equality

4. Write the algebraic property that justifies this step in solving for m .

Equation: $3(m - 9) = 9$

Step: $3m - 27 = 9$ _____

Practice:

Which property provides justification for Step 4?

1. $\frac{2}{4}x - 4 = \frac{3}{4}x$ Given
2. $-4 = \frac{1}{4}x$ Addition property of equality
3. $\frac{1}{4}x = -4$ Reflexive property of equality
4. $x = -16$?

- [A] Addition property of equality [B] Multiplication property of equality
[C] Distributive property of multiplication [D] Reflexive property of equality

Which property justifies this step in solving for a ?

Equation: $-3(6a) = 72$

Step: $(-3 \cdot 6)a = 72$

- [A] Distributive property of multiplication [B] Addition property of equality
[C] Substitution property of equality [D] Associative property of multiplication

Additional Help:

<http://mathbitsnotebook.com/Algebra1/LinearEquations/LEjustify.html>

<https://www.opened.com/homework/a-rei-1-explain-each-step-in-solving-a-simple-equation-as/3691742>