D. to apply what is known to confirm an expected result

distributive

property

1. the property stating that the product of a factor times a given quantity containing a sum or difference is equal to the sum of the products of that factor times each addend within the quantity
2. to determine the value of

evaluate

properties of equality

A. the rules that allow you to balance, manipulate, and solve equations

verify

**Words to Know**

*Write the letter of the definition next to the matching word as you work through the lesson. You may use the glossary to help you.*

# **Warm-Up** Solving with the Distributive Property



**?**

**W2K**

**Lesson Question**

**Use** the

property to solve real-world problems.

**Verify** and **explain** the steps in

this process.

**Lesson Goals**

**Apply** the distributive property to solve one-variable

equations.

**Slide**



*x* =

12 12

12*x*  24

−30

−12*x* − (−30) = 6

−12*x* + 30 = 6

−30

) = 6

−6(2*x*) − (−6)(

**property** to remove parentheses.

1. Use the subtraction or addition **property of equality**

to isolate the term.

1. Use the multiplication or

property of equality to isolate the variable.

**How to Solve an Equation Using the Distributive Property**

**PROCEDURE**

−6(2*x* − 5) = 6

1. Use the

**2**

**5**



property of equality Divide both sides by 12.

Division property of equality

Step 3: *x* = −2.5

the variable term by adding

20 to both sides.

Step 2: 12*x* =

Distributive property

− 20 = −50

4(3*x* − 5) = −50

Step 1:

**Identifying the Steps**

Use the steps to solve the equation. Determine which properties justified each step.

**Slide**

## Verifying a Solution

### EXAMPLE

Look at the steps and at the solution.

|  |  |  |  |
| --- | --- | --- | --- |
|  | 10(*a* − 4) = 90 |  | |
| 10*a* − | = 90 | Distributive property | |
|  | + 40 + 40 | Inverse property of |  |

10*a*  130

Inverse property of

10 10

**7**



*a* =

**Verify** the answer using .

10(*a* − 4) = 90

10(13 − 4) = 90

10(9) = 90

= 90

It’s a balanced equation, so we know our solution is correct.

**Slide**

## Representing a Real-World Scenario

### REAL-WORLD CONNECTION

Janice is building a fence around a rectangular garden in her backyard. The area of the garden will be 240 square feet. The width of the garden is *x* feet shorter than its length, which is 20 feet. How many feet of fencing does Janice need?

Draw a picture:

**10**

20 – *x*

20

Write an equation:

*A* =

240 = (20 − *x*)

The above equation models the situation given in the word problem.

**Slide**

## Solving a Real-World Linear Equation

### EXAMPLE

Janice’s Rectangular Garden

ft

Simplify and solve the equation.

240 = 20(20) −

240 = 400 − 20*x*

−400 − 400

20 – *x* ft

160

20

  20*x*

***A*** 

### 240 = 20(20 - *x*)

**Evaluate** to find the width of the garden.

8 = *x*

*x* = 8

**12**



20 − = 12 ft

So the width of our garden is feet.

**Slide**

## Verifying the Real-World Scenario

Janice’s Rectangular Garden 20 ft

20 – *x* ft

***A*** = ***lw***

**240** = **20(20** − ***x*)**

240 = 20(20 − )

*x* = 8; width = 12 ft; length = 20 ft 240 = ⋅ 12

240 = 240

The other way to verify it is just multiply out the length and width of the rectangle.

240 = ⋅ 20

240 = 240

How much fencing does Janice need?

***P* = + 2*w***

*P* = 2(20) + 2(12)

= 40 + 24

= 64 ft

**14**

Janice needs to go and buy feet of fencing.



# **Summary** Solving with the Distributive Property

**?**

How do you solve linear equations using the distributive property?

**Lesson Question**

**Answer**

*Use this space to write any questions or thoughts about this lesson.*