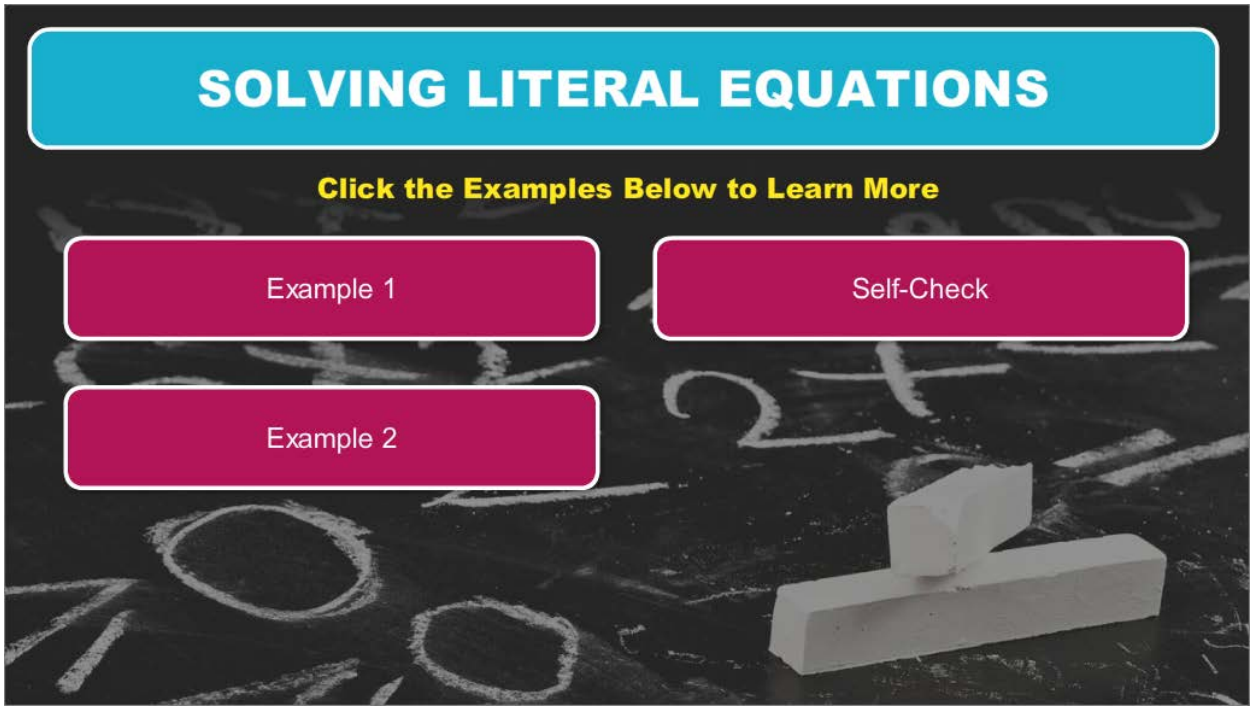
Module 5: Solving Linear Equations

Topic 1 Content: Solving Literal Equations

Introduction

Hello and welcome! I'm so glad you could join me for this lesson in Algebra I, where you will learn how to apply the properties of equality to solve literal equations.

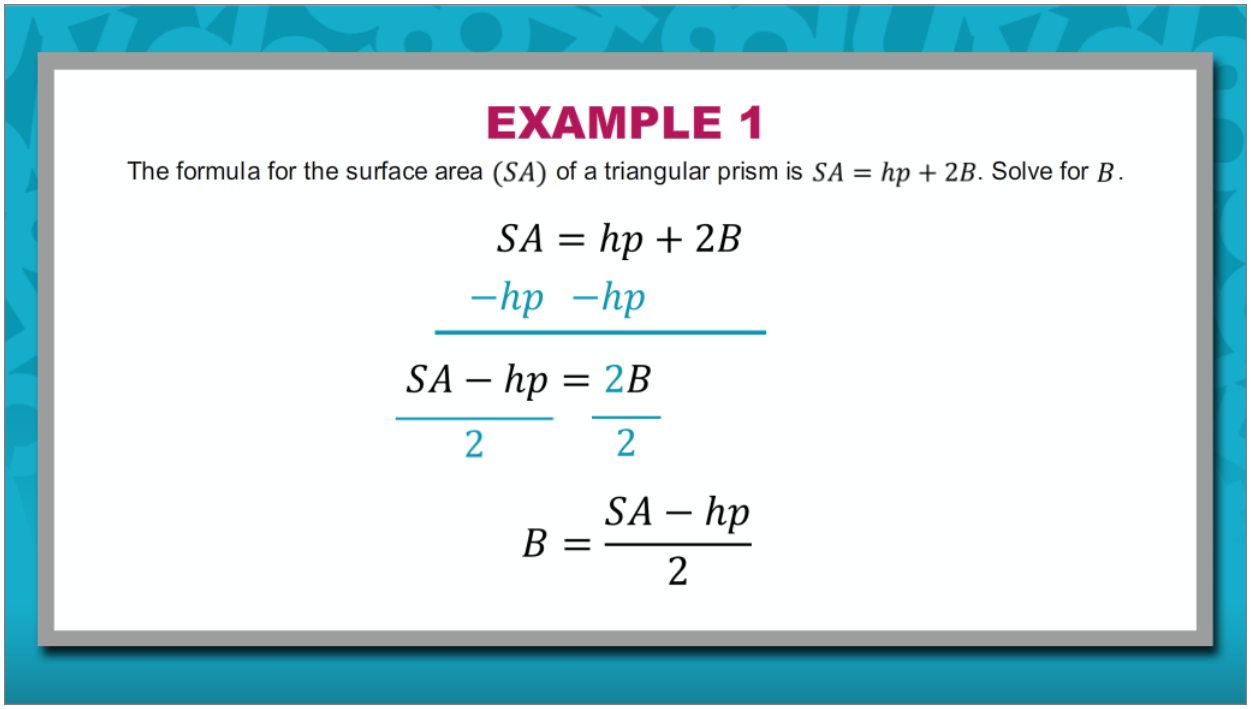
Solving Literal Equations



Click the examples below to learn more.

- Example One
- Example Two
- Self-Check

Example 1



The formula for the surface area (SA) of a triangular prism is $SA = hp + 2B$.
Solve for B.

$SA = hp + 2B$
$SA = hp + 2B$
$-hp \quad -hp$
$SA - hp = 2B$

Because you are asked to solve for B, the goal in this equation is to isolate B.

Begin by applying the Subtraction Property of Equality; subtract hp from each side of the equation. The result is $SA - hp = 2B$. You are now one step closer to isolating B.

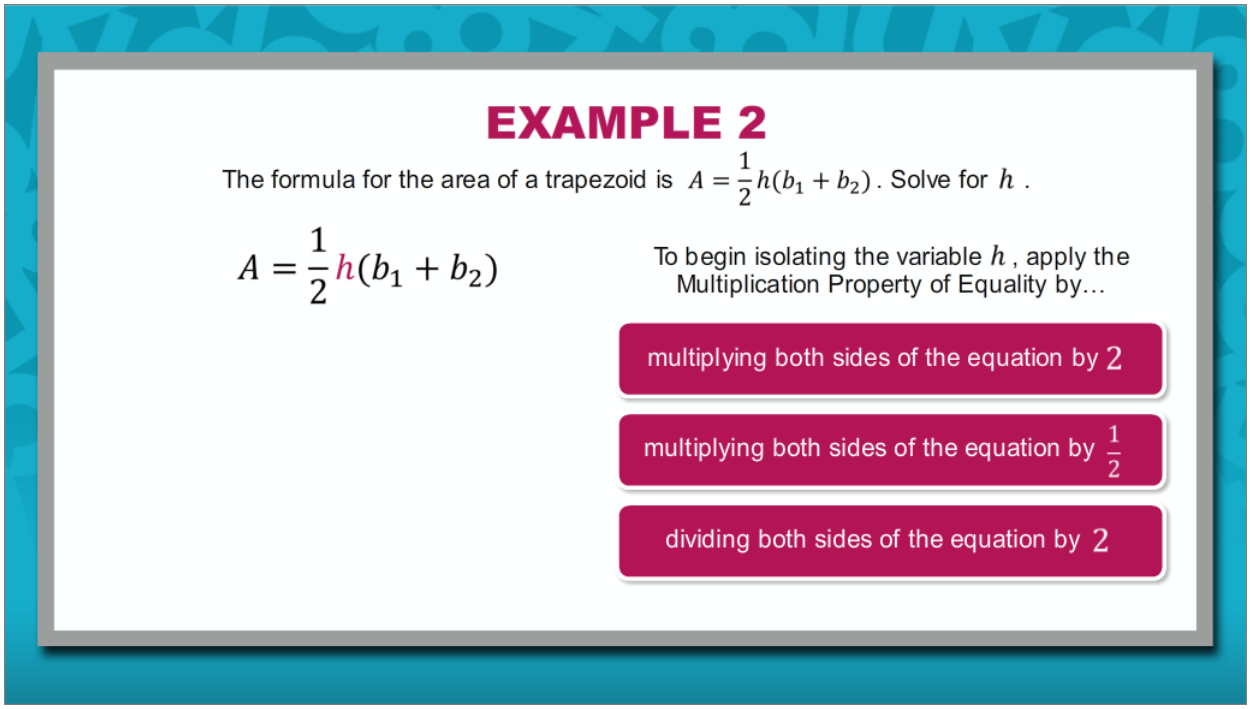
$SA = hp + 2B$
$-hp \quad -hp$
$\frac{SA - hp}{2} = \frac{2B}{2}$

$\frac{SA - hp}{2} = B$

$B = \frac{SA - hp}{2}$

Notice that B has a coefficient of 2. The final step to isolating B is to apply the Division Property of Equality; divide both sides of the equation by 2. The result is $\frac{SA-hp}{2} = B$. Or if you prefer, apply the Symmetric Property of Equality to state the result as $B = \frac{SA-hp}{2}$.

Example 2



The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Solve for h.

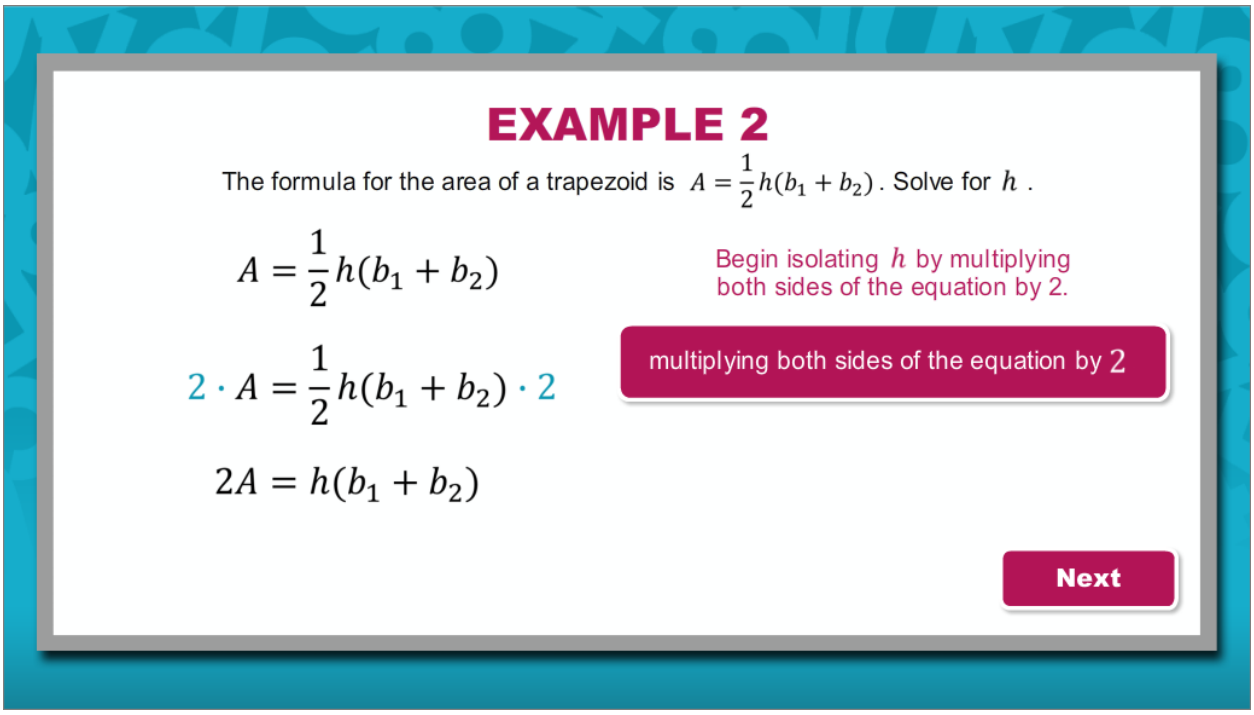
$$A = \frac{1}{2}h(b_1 + b_2)$$

The goal for this equation is to isolate h.

To begin isolating the variable h, apply the Multiplication Property of Equality by…

A) multiplying both sides of the equation by 2
B) multiplying both sides of the equation by $\frac{1}{2}$
C) dividing both sides of the equation by 2

Example 2 (continued)



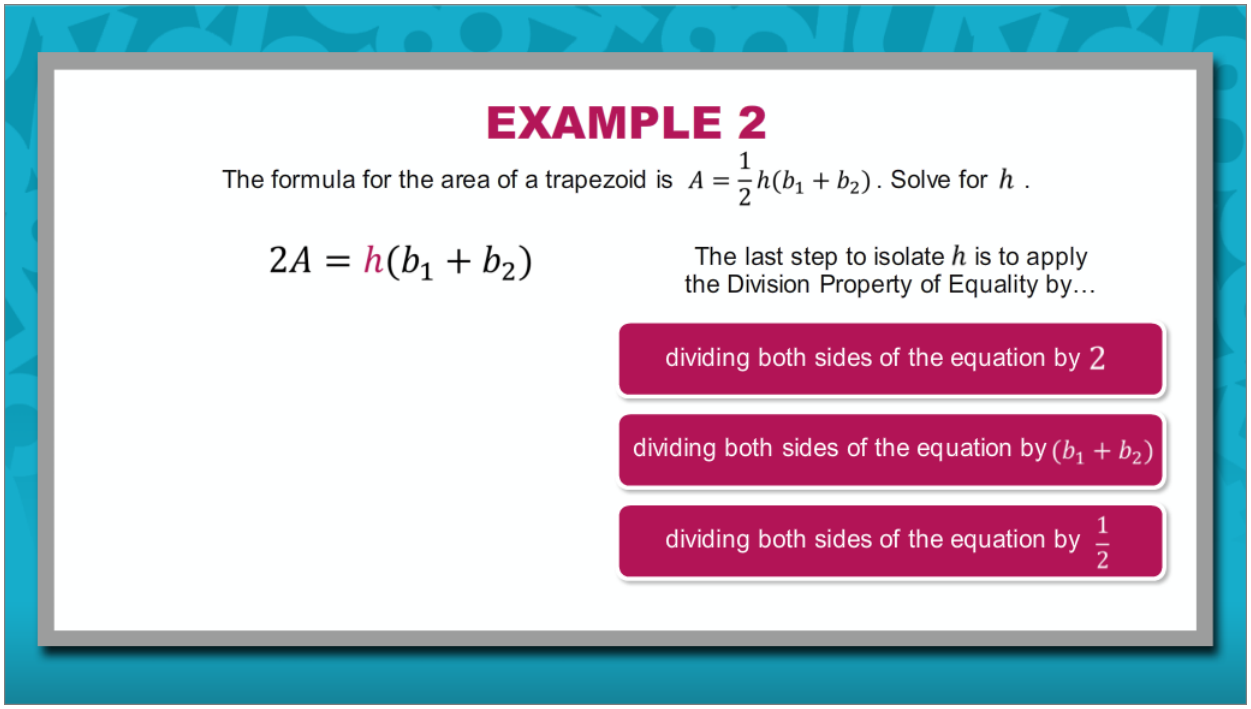
The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Solve for h.

$$A = \frac{1}{2}h(b_1 + b_2)$$

Begin isolating h by multiplying both sides of the equation by 2.

$$2 \cdot A = \frac{1}{2}h(b_1 + b_2) \cdot 2$$
$$2A = h(b_1 + b_2)$$

Example 2 (continued)



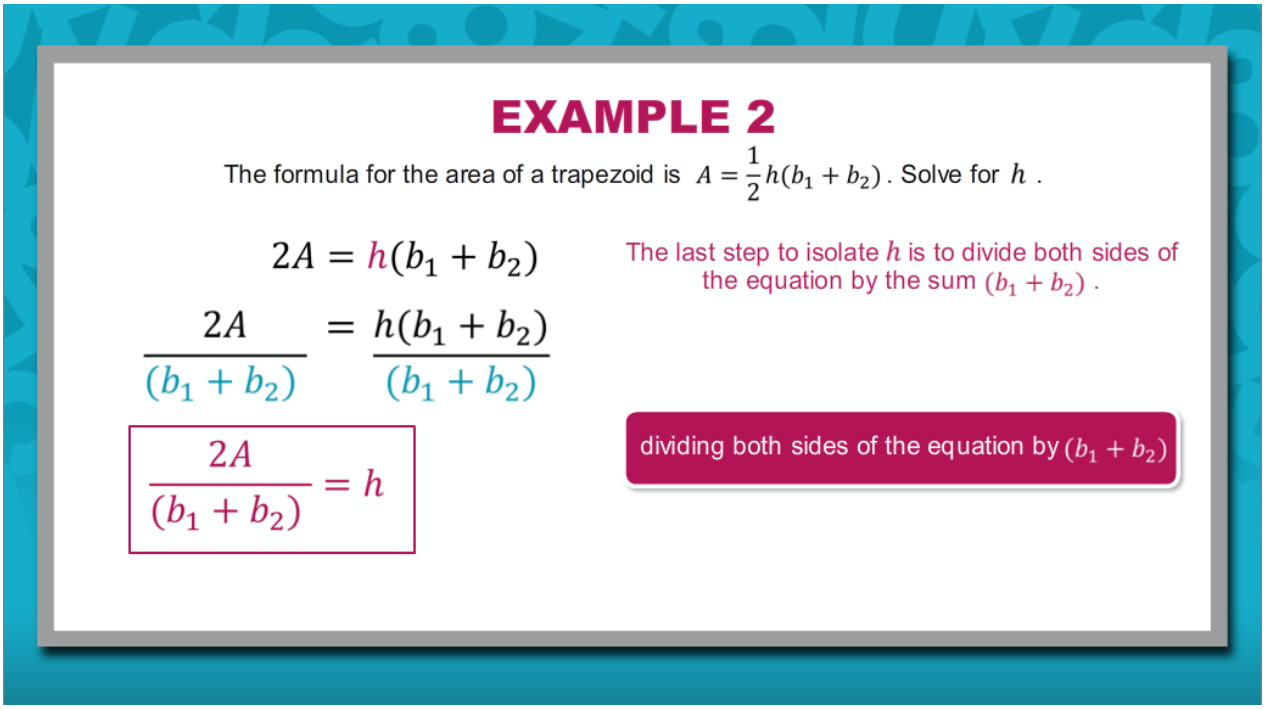
The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Solve for h.

$$2A = h(b_1 + b_2)$$

The last step to isolate h is to apply the Division Property of Equality by…

A) dividing both sides of the equation by 2
B) dividing both sides of the equation by $(b_1 + b_2)$
C) dividing both sides of the equation by 2

Example 2 (continued)



The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Solve for h.

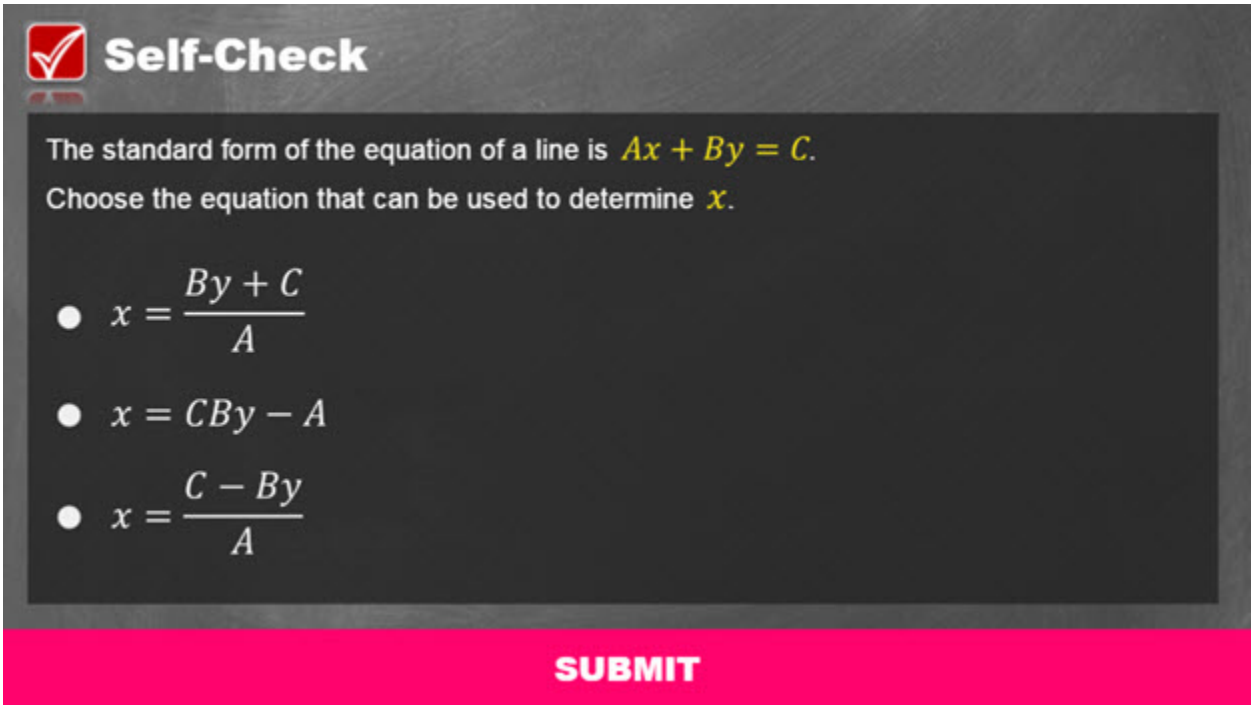
$$2A = h(b_1 + b_2)$$

The last step to isolate h is to divide both sides of the equation by the sum $(b_1 + b_2)$.

$$\frac{2A}{(b_1 + b_2)} = \frac{h(b_1 + b_2)}{(b_1 + b_2)}$$

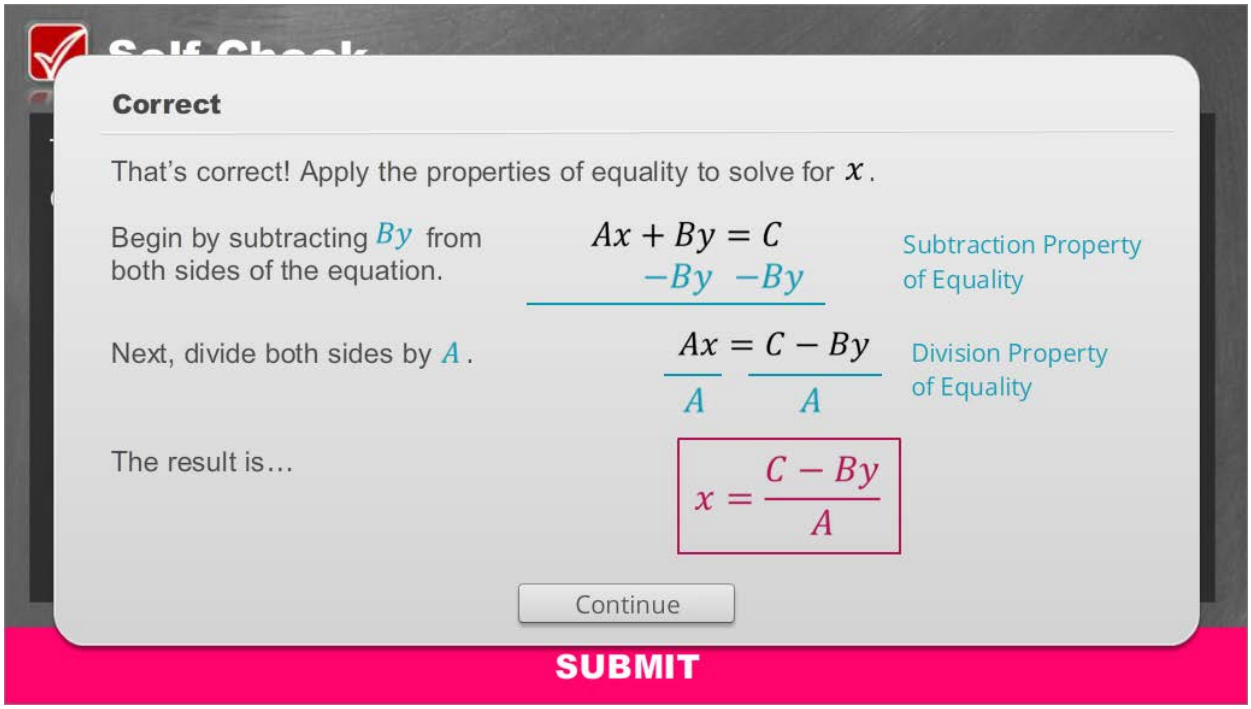
$$\frac{2A}{(b_1 + b_2)} = h$$

Self-Check



Solve the problem in the image above to check your understanding of the content.

Self-Check: Answer



For your reference, the image above shows the correct solution to the self-check problem.

Conclusion

You have reached the conclusion of this lesson where you learned how to apply the properties of equality to solve literal equations.