

Models can help you understand how to solve equations that have variables on both sides.

EXAMPLE

Model and solve $3a - 2 = a + 4$.

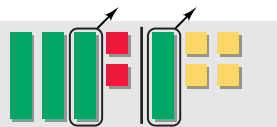
$$3a - 2 = a + 4$$



The tiles model the equation.

$$3a - 2 - a = a + 4 - a$$

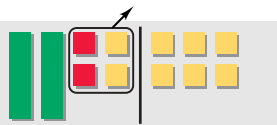
$$2a - 2 = 4$$



Use the Subtraction Property of Equality. Subtract a from each side to get the variable on one side of the equation.

$$2a - 2 + 2 = 4 + 2$$

$$2a = 6$$



Use the Addition Property of Equality. Add 2 to each side. Remove zero pairs.

$$\frac{2a}{2} = \frac{6}{2}$$



Use the Division Property of Equality. Divide each side into two identical groups.

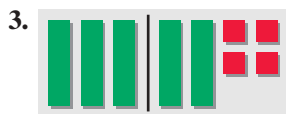
$$a = 3$$



Each green tile equals three yellow tiles, so $a = 3$.

EXERCISES

Write an equation for each model. Use tiles to solve each equation.



Use tiles to model and solve each equation.

5. $4x + 2 = 2x + 6$

6. $2y - 2 = 4y + 2$

7. $2a + 2 = a + 8$

8. $5b - 4 = 2b + 5$

9. $z - 8 = 2z - 1$

10. $4(p + 1) = 2p - 2$

11. $5n - 3 = 2(n + 3)$

12. $2(k + 1) = 5(k - 2)$