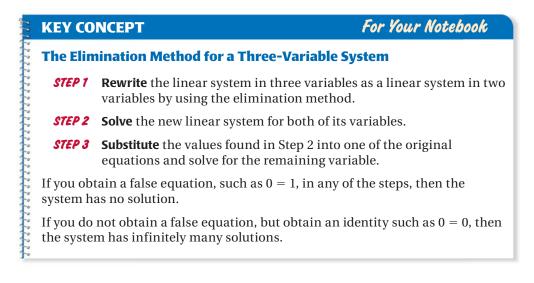
**ELIMINATION METHOD** The elimination method you studied in Lesson 3.2 can be extended to solve a system of linear equations in three variables.



	EXA	MPLE	1
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## Use the elimination method

Solve the system.	4x + 2y + 3z = 1	<b>Equation</b> 1
	2x - 3y + 5z = -14	<b>Equation 2</b>
	6x - y + 4z = -1	<b>Equation 3</b>

## Solution

*STEP 1* **Rewrite** the system as a linear system in *two* variables.

```
4x + 2y + 3z = 1Add 2 times Equation 312x - 2y + 8z = -2to Equation 1.16x + 11z = -1New Equation 12x - 3y + 5z = -14Add -3 times Equation 3-18x + 3y - 12z = 3to Equation 2.-16x - 7z = -11New Equation 2
```

*STEP 2* **Solve** the new linear system for both of its variables.

16x + 11z = -1	Add new Equation 1
-16x - 7z = -11	and new Equation 2.
4z = -12	
z = -3	Solve for z.
x = 2	Substitute into new Equation 1 or 2 to find <i>x</i> .

## *STEP 3* Substitute x = 2 and z = -3 into an original equation and solve for *y*.

6x - y + 4z = -1 Write original Equation 3. 6(2) - y + 4(-3) = -1 Substitute 2 for x and -3 for z. y = 1 Solve for y.

The solution is x = 2, y = 1, and z = -3, or the ordered triple (2, 1, -3). Check this solution in each of the original equations.

## **ANOTHER WAY**

In Step 1, you could also eliminate *x* to get two equations in *y* and *z*, or you could eliminate *z* to get two equations in *x* and *y*.