Solving by Elimination

Elimination: line the equations up, make one variable's coefficients opposites, add so it cancels, solve, back-substitute, check the pair in both.

Name _____ Date _____

Words we use

say the math word, then the plain English

WORD	PLAIN ENGLISH	WHAT YOU DO
Elimination (linear combination)	Add or subtract the equations so one variable cancels.	Line them up, make opposite coefficients, add.
Opposite coefficients	Numbers like 3 and –3 that add to 0: additive inverses.	The variable's terms add to 0 and it disappears.
Multiply an equation	Multiply both sides, every term, by the same number (Unit 1).	To turn coefficients into opposites.
Make a zero appear	Adding an opposite gives the additive identity 0 (Unit 1, Lesson 1).	The whole reason elimination works.
Back-substitute	Put the number found into either original equation to get the other variable.	Then check the pair in both.
Choose the method	Graph to see; substitute when a variable is alone; eliminate when coefficients line up.	All three turn two variables into one.

Part A Opposites already there

Add, solve, back-substitute, check.

1. $x + y = 9$ and $x - y = 3$

2. $2x + 3y = 12$ and $4x - 3y = 6$

3. $3x + 2y = 16$ and $x + 2y = 8$ (equal, so subtract)

Part B Multiply first

Say what you multiplied and by what.

1. $x + 2y = 7$ and $3x - y = 7$

2. $4x + y = 14$ and $2x - 3y = 0$

3. $2x + 3y = 8$ and $3x + 2y = 7$ (multiply both)

Part C Choose the method, and in your own words

1. $y = 4x - 1$ and $2x + y = 11$: which method, and why?

2. $5x + 2y = 9$ and $3x - 2y = 7$: which method, and why?

3. Why is adding two equations allowed?

4. How is elimination the make-a-zero-appear idea from Unit 1?

Part D Exit ticket

1. $x + y = 8$ and $x - y = 2$:

2. To eliminate y from $2x + 5y = 1$ and $3x - y = 10$, multiply which equation by what?

Answer key

Part A. 1. (6, 3). 2. (3, 2). 3. (4, 2).

Part B. 1. Second by 2: (3, 2). 2. First by 3: (3, 2). 3. First by 3, second by –2 (or first by 2, second by –3): (1, 2).

Part C. 1. Substitution: y is alone. 2. Elimination: 2y and –2y are opposites. 3. Adding equal things to equal things keeps them equal. 4. Opposite coefficients are additive inverses; they add to 0 and the variable disappears.

Part D. 1. (5, 3). 2. The second by 5.