LESSON MAKER PRO

Cancel or Substitute?

Solve systems and choose an efficient method.

HIGH SCHOOL · A1P.AF.C.10.a

A1P.AF.C.10.a "Solve a system of two equations in two variables by using linear combinations; contrast situations in which use of linear combinations is more efficient with those in which substitution is more efficient."

NAME _____ DATE _____

CHOOSE YOUR MOVE

Add or subtract equations to cancel one variable. If neither variable cancels, multiply one or both equations first. When a variable is already alone, substitution may take fewer steps.

WORKED EXAMPLE

Use linear combinations to solve $7x + 8y = 114$ and $7x - 8y = -30$.

1. Add the equations: $14x = 84$.
2. Divide by 14: $x = 6$.
3. Substitute into the first equation: $7(6) + 8y = 114$, so $8y = 72$.
4. Divide by 8: $y = 9$.

Answer: (x, y) = (6, 9)

PRACTICE 6 problems

1 Use linear combinations to solve $x + y = 5$ and $x - y = 1$.

ANSWER _____

2 Use linear combinations to solve $4x + y = 13$ and $4x - y = 3$.

ANSWER _____

3 Use linear combinations to solve $2x + 3y = 11$ and $4x - 3y = 13$.

ANSWER _____

4 Use linear combinations to solve $3x + 4y = 19$ and $5x + 6y = 29$.

ANSWER _____

5 Choose linear combinations or substitution to solve $x = 2y + 1$ and $3x - 2y = 11$. State why you chose that method.

ANSWER _____

6 Choose linear combinations or substitution to solve $2x + 5y = 17$ and $2x - 5y = -13$. State why you chose that method.

ANSWER _____

APPLY IT Show your work

1 At a school concert, 2 student tickets and 3 adult tickets cost $31. Four student tickets and 1 adult ticket cost $37. Use linear combinations to find the price of each ticket.

WORK SPACE

ANSWER _____

2 A music store charges the same price for each song download and the same price for each album download. Three songs and 2 albums cost $29. Five songs and 2 albums cost $35. Use linear combinations to find each price.

WORK SPACE

ANSWER _____

CHALLENGE One step up

For each system, choose linear combinations or substitution and solve. Explain in one sentence per system why your method is efficient. System A: $4x + 3y = 22$ and $4x - 3y = 10$. System B: $y = 2x + 1$ and $3x + y = 11$.

WORK SPACE AND ANSWER

ANSWER KEY

Cancel or Substitute?

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use linear combinations to solve x + y = 5 and x - y = 1.	**(x, y) = (3, 2)**
2	Use linear combinations to solve 4x + y = 13 and 4x - y = 3.	**(x, y) = (2, 5)**
3	Use linear combinations to solve 2x + 3y = 11 and 4x - 3y = 13.	**(x, y) = (4, 1)**
4	Use linear combinations to solve 3x + 4y = 19 and 5x + 6y = 29.	**(x, y) = (1, 4)**
5	Choose linear combinations or substitution to solve x = 2y + 1 and 3x - 2y = 11. State why you chose that method.	**(x, y) = (5, 2). Substitution is efficient because x is already alone.**
6	Choose linear combinations or substitution to solve 2x + 5y = 17 and 2x - 5y = -13. State why you chose that method.	**(x, y) = (1, 3). Linear combinations is efficient because the y terms cancel when the equations are added.**

PART 2 · APPLY IT

1. **Student ticket: $8. Adult ticket: $5.** Let s and a be the ticket prices. Multiply 4s + a = 37 by -3 and add it to 2s + 3a = 31 to get -10s = -80, so s = 8 and a = 5.
2. **Song: $3. Album: $10.** Subtract 3s + 2a = 29 from 5s + 2a = 35 to get 2s = 6. Then s = 3 and a = 10.

CHALLENGE

For system A, linear combinations is efficient because the y terms cancel when added, giving (x, y) = (4, 2). For system B, substitution is efficient because y is already alone, giving (x, y) = (2, 5).

Accept equivalent solution notation. For method-choice items, accept another correctly explained efficient approach.