LESSON MAKER PRO

Choose Your Move

Solve systems and decide which method saves steps.

GRADE 8 · 8A.AF.D.12.a

8A.AF.D.12.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 _____

CANCEL OR SUBSTITUTE?

In a linear combination, add or subtract equations so one variable cancels. This is often faster when coefficients match or are opposites. If a variable is already alone, substitution may take fewer steps.

WORKED EXAMPLE

Solve $3x + 4y = 26$ and $3x - 4y = 10$ by using a linear combination.

1. Add the equations: $6x = 36$.
2. Divide by 6: $x = 6$.
3. Substitute into the first equation: $18 + 4y = 26$, so $y = 2$.

Answer: x = 6, y = 2

PRACTICE 6 problems

1 Use a linear combination to solve $x + y = 9$ and $x - y = 1$.

ANSWER _____

2 Use a linear combination to solve $2x + 5y = 19$ and $2x - 5y = -11$.

ANSWER _____

3 Use a linear combination to solve $5x + 2y = 23$ and $3x - 2y = 9$.

ANSWER _____

4 Use a linear combination to solve $2x + 3y = 12$ and $5x + 2y = 19$. First, multiply one or both equations so a variable can cancel.

ANSWER _____

5 Use substitution to solve $y = x + 2$ and $3x + y = 14$.

ANSWER _____

6 Use substitution to solve $x = 2y - 1$ and $x + y = 14$.

ANSWER _____

APPLY IT Show your work

1 At a movie theater, 2 student tickets and 1 adult ticket cost $31. One student ticket and 2 adult tickets cost $35. What does each ticket cost? Write a system and solve it.

WORK SPACE

ANSWER _____

2 At an arcade, 3 game passes and 2 snack vouchers cost $21. Five game passes and 2 snack vouchers cost $31. What does each item cost? Write a system and solve it.

WORK SPACE

ANSWER _____

CHALLENGE One step up

For each system, choose the faster method, solve it, and explain why your choice saves steps. A: $x = 2y + 1$ and $x + y = 16$. B: $6x + 5y = 34$ and $6x - 5y = 14$.

WORK SPACE AND ANSWER

ANSWER KEY

Choose Your Move

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use a linear combination to solve x + y = 9 and x - y = 1.	**x = 5, y = 4**
2	Use a linear combination to solve 2x + 5y = 19 and 2x - 5y = -11.	**x = 2, y = 3**
3	Use a linear combination to solve 5x + 2y = 23 and 3x - 2y = 9.	**x = 4, y = 1**
4	Use a linear combination to solve 2x + 3y = 12 and 5x + 2y = 19. First, multiply one or both equations so a variable can cancel.	**x = 3, y = 2**
5	Use substitution to solve y = x + 2 and 3x + y = 14.	**x = 3, y = 5**
6	Use substitution to solve x = 2y - 1 and x + y = 14.	**x = 9, y = 5**

PART 2 · APPLY IT

1. **Student ticket: $9; adult ticket: $13.** Let s be the student price and a be the adult price. Subtract 2s + a = 31 from s + 2a = 35 to get a - s = 4, then solve to get s = 9 and a = 13.
2. **Game pass: $5; snack voucher: $3.** Let g be the pass price and v be the voucher price. Subtract 3g + 2v = 21 from 5g + 2v = 31 to get 2g = 10, then substitute g = 5 to get v = 3.

CHALLENGE

A: Substitution is faster because x is already alone. Substituting gives 3y + 1 = 16, so y = 5 and x = 11. B: A linear combination is faster because the y terms cancel when the equations are added. This gives 12x = 48, so x = 4 and y = 2.

Accept ordered pairs with x listed first. For the challenge, accept either correct method when the explanation shows how it saves steps.