

Substitution Review

Solve each system using the **substitution strategy**. Show your substitutions and verify your solution when appropriate.

Numerical Problems

- | | | |
|---|---|---|
| 1.
$\begin{aligned}y &= 2x + 1 \\ y &= -x + 10\end{aligned}$ | 3.
$\begin{aligned}y &= 3x - 7 \\ 2x + y &= 13\end{aligned}$ | 5.
$\begin{aligned}2x + y &= 11 \\ 2x - 3y &= -9\end{aligned}$ |
| 2.
$\begin{aligned}x &= 2y - 4 \\ x + y &= 11\end{aligned}$ | 4.
$\begin{aligned}3x - y &= 7 \\ y &= x + 1\end{aligned}$ | 6.
$\begin{aligned}2x + 3y &= 12 \\ 6x - y &= 16\end{aligned}$ |

Word Problems

For each problem:

- Define your variables.
- Write a system of two linear equations.
- Solve the system using **substitution**.
- Answer the question in a complete sentence.

Sales Problems

7. At a school play, 120 tickets were sold. Adult tickets cost \$8 and student tickets cost \$5. A total of \$780 was collected. How many adult tickets and how many student tickets were sold?
8. A school sold 75 pieces of clothing as part of a fundraiser. T-shirts sold for \$18 each and hoodies sold for \$30 each. A total of \$1710 was collected. How many T-shirts and how many hoodies were sold?

Value Problems

9. A farmer has 300 hectares of land divided between cropland and woodland. Cropland produces an average of \$220 per hectare and woodland produces an average of \$80 per hectare. The land produces \$52 000 in total revenue. How many hectares of each type of land does the farmer have?
10. A school purchases 80 calculators. Basic calculators cost \$18 each and scientific calculators cost \$32 each. The total cost is \$2000. How many of each type of calculator were purchased?

Picture Problems

11. A rectangular photograph is 6 cm longer than it is wide. The length and width together total 30 cm. Determine the dimensions of the photograph.
12. The opening of a rectangular picture frame is 4 cm narrower than it is tall. The height and width together total 44 cm. Determine the dimensions of the opening.

Coin Problems

13. A jar contains 30 coins consisting only of dimes and quarters. The coins have a total value of \$5.25. How many dimes and how many quarters are in the jar?
14. A jar contains 37 loonies and toonies. The coins have a total value of \$58. How many loonies and how many toonies are in the jar?

Numeracy Problems

15. Two numbers have a sum of 34. Their difference is 8. Determine the two numbers.
16. One number is 3 more than twice another number. Their sum is 39. Determine the two numbers.

Perimeter Problems

17. A rectangular garden has a perimeter of 50 m. Its length is 5 m greater than its width. Determine the dimensions of the garden.
18. A rectangular animal enclosure has a perimeter of 96 m. Its length is 6 m more than twice its width. Determine the dimensions of the enclosure.