4.3

Solving Systems Using Elimination

Solve each system using elimination.

1. $x + y = 2$
$x - y = 4$

2. $x + 2y = 3$
$x - y = 6$

3. $2x - y = 4$
$3x - y = 2$

4. $x - 2y = -2$
$-x + y = 3$

5. $-x - 3y = -3$
$2x + 3y = 5$

6. $x + 2y = -4$
$x + y = 2$

7. $3x - 2y = 8$
$2x - 2y = 5$

8. $x - 2y = 3$
$3x - y = 2$

9. $2x - 4y = -6$
$x - y = -1$

10. Writing For the system $\begin{matrix} 3x - 5y = 9 \\ 2x + y = 3 \end{matrix}$, which variable should you eliminate first and why? How will you eliminate that variable?

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$3x - 5y = 4$	$6x - 10y = 8$	Multiply equation 1 by 2.
$-2x + 3y = 2$	$-6x + 3y = 6$	Multiply equation 2 by 3.
	$-7y = 14$	Add the equations.
	$y = -2$	Divide by -7.

16. You drive a car that runs on ethanol and gas. You have a 20-gallon tank to fill and you can buy fuel that is either 25 percent ethanol or 85 percent ethanol. How much of each type of fuel should you buy to fill your tank so that it is 50 percent ethanol?

17. Your math test has 38 questions and is worth 200 points. The test consists of multiple-choice questions worth 4 points each and open-ended questions worth 20 points each. How many of each type of question are there?

18. A student bought 3 boxes of pencils and 2 boxes of pens for \$6. He then bought 2 boxes of pencils and 4 boxes of pens for \$8. Find the cost of each box of pencils and each box of pens.

Solve each system using elimination. Tell whether the system has *one solution, infinitely many solutions,* or *no solution.*

19. $x - 3y = -7$
$2x = 6y - 14$

20. $3x - 5y = -2$
$x + 3y = 4$

21. $x + 2y = 6$
$2x - 4y = -12$

22. $5x + y = 15$
$3y = -15x + 6$

23. $3x = 4y - 5$
$12y = 9x + 15$

24. $3x - y = -2$
$-2x + 2y = 8$

25. $x + 2y = -4$
$-3x + 2y = 4$

26. $x + y = -2$
$-x - y = 4$

27. $3x - 2y = -3$
$6y = 9x + 9$

28. $-4x - 3y = 5$
$3x - 2y = -8$

29. $x - 3y = 1$
$2x + 2y = 10$

30. $-4x - 2y = 20$
$2x + y = 19$

31. How is the multiplication or division property of equality used in the elimination method? Are the properties always needed? Explain.