Systems of Equations … Verbal Problems

Solve each of the following systems of equations by graphing.

1. $\begin{array}{l} x - y = -1 \\ 2x + y = 4 \end{array}$

2. $\begin{array}{l} 2x - 3y = -3 \\ 2x + 3y = 3 \end{array}$

3. $\begin{array}{l} x + 2y = 4 \\ 3x - 2y = 4 \end{array}$

4. $\begin{array}{l} x - 4y = 4 \\ 3x + y = -1 \end{array}$

5. $\begin{array}{l} x - 2y = -2 \\ 2x - y = 2 \end{array}$

6. $\begin{array}{l} x = -2 \\ 4x + 3y = -2 \end{array}$

7. $\begin{array}{l} 3x + y = -2 \\ 6x + 2y = 4 \end{array}$

8. $\begin{array}{l} 2x + y = 3 \\ x - 4y = 6 \end{array}$

9. $\begin{array}{l} -5x + 2y = 4 \\ 15x - 6y = -12 \end{array}$

Solve each of the following systems of equations using the substitution method.

10. $\begin{array}{l} x - y = 3 \\ x + y = 5 \end{array}$

11. $\begin{array}{l} 2x + y = 1 \\ -x - 2y = -5 \end{array}$

12. $\begin{array}{l} x - 4y = -1 \\ 3x + 5y = 31 \end{array}$

13. $\begin{array}{l} 2x - 3y = 6 \\ -6x + y = 14 \end{array}$

14. $\begin{array}{l} 3x - 4y = 10 \\ 2y + 4x = 6 \end{array}$

15. $\begin{array}{l} -2x + 3y = 3 \\ 2x - 3y = 12 \end{array}$

16. $\begin{array}{l} x - 3y = 0 \\ 4x + 8y = 5 \end{array}$

17. $\begin{array}{l} 4x + 5y = 2 \\ 4x - 20y = -3 \end{array}$

18. $\begin{array}{l} 2x - 3y = 1 \\ -6x + 9y = -3 \end{array}$

Solve each of the following systems of equations using the linear combination method.

19. $\begin{array}{l} 4x + 3y = 0 \\ 5x - 3y = 27 \end{array}$

20. $\begin{array}{l} 3x + y = 5 \\ 6x - 2y = 4 \end{array}$

21. $\begin{array}{l} 3x - 2y = -4 \\ 6x + 5y = 37 \end{array}$

22. $\begin{array}{l} 4x - 7y = -5 \\ 3x - 2y = -7 \end{array}$

23. $\begin{array}{l} 2x + 3y = 3 \\ -3x + 5y = 6 \end{array}$

24. $\begin{array}{l} 3x + 2y = -1 \\ 4x - 5y = -32 \end{array}$

25. $\begin{array}{l} 4x - 5y = -2 \\ -12x + 15y = 6 \end{array}$

26. $\begin{array}{l} -7x + 2y = 4 \\ 3x - 5y = -2 \end{array}$

27. $\begin{array}{l} 5x + 2y = -6 \\ 3x + 7y = 8 \end{array}$

Solve each of the following systems of equations using any method you wish.

28. $\begin{array}{l} \dfrac{x}{2} - \dfrac{y}{5} = -4 \\ 3x + \dfrac{y}{2} = -7 \end{array}$

29. $\begin{array}{l} 0.05x + 0.06y = 128 \\ x + y = 2400 \end{array}$

30. $\begin{array}{l} 7x + 2y = 3 \\ 4x + 3y = 11 \end{array}$

31. $\begin{array}{l} \dfrac{1}{4}(x - y) = 2 \\ \dfrac{1}{6}(x + y) = 2 \end{array}$

32. $\begin{array}{l} x + y = 72 \\ 0.10x + 0.25y = 15.90 \end{array}$

33. $\begin{array}{l} \dfrac{a}{4} + \dfrac{b}{3} = -2 \\ \dfrac{a}{2} - b = 16 \end{array}$

Word Problems Using Systems of Equations

34.   Your aunt and uncle have been visiting at your home. Five minutes after they drive away, you realize that they forgot their luggage. You happen to know that they drive slowly, so you get in your car and drive to catch up with them. Your average speed is 10 miles an hour faster that their average speed, and you catch up with them in 25 minutes. How fast did you drive?

35.   You run an accounting business that specializes in auditing (verifying accounting records). One of your auditors is working on the payroll records for a company with 75 employees. Some are part-time and some are full-time. After working for three days, your auditor tells you that the audit is completed for half of the full-time employees, but there are still 50 employee records to audit. Find out how many of the employees are full time and how many are part-time.

36.   You invited 56 people to your graduation party. You can afford to rent 5 tables, round and/or rectangular (each costing the same). Each round table can seat 8 people and each rectangular table can seat 12 people. How many round and rectangular tables should you rent?

37.   You collect baseball and football cards. Your uncle has an old collection of 360 cards that he gives to you. The collection has more baseball cards than football cards. In fact, it has 30 more baseball cards than twice the number of football cards. How many of each type are in your uncle's collection?

38.   Your family receives basic cable television and one movie channel for $39 a month. Your neighbor receives basic cable and two movie channels for $45.50. What is the monthly charge for basic cable? (Assume that each movie channel has the same monthly charge.)

39.   A hotel has 260 rooms. Some are singles, and some are doubles. The singles cost $35 and the doubles cost $60. Because of a math teachers' convention, all of the hotel rooms are occupied. The sales for this night are $14,000. How many of each type of room does the hotel have?

40.   Tickets for the homecoming dance cost $20 for a single ticket or $35 for a couple. Ticket sales totaled $2280, and 128 people attended. How many tickets of each type were sold?

41.   A grain storage warehouse has a total of 30 bins. Some hold 20 tons of grain each, and the rest hold 15 tons each. How many of each type of bin are there if the capacity of the warehouse is 510 tons?

42.   An overseas phone call is charged at one rate (a fixed amount) for the first minute and at a different rate for each additional minute. If a 7 minute call costs $10, and a 4 minute call costs $6.40, find each rate.

43.   A financial planner wants to invest $8000, some in stocks earning 15% annually and the rest in bonds earning 6% annually. How much should be invested at each rate to get a return of $930 annually from the two investments?