

**Example A.6.1.** Solve the following systems of equations. Check your answer algebraically and graphically. (Said another way, make sure both  $x$  and  $y$  are correct!)

$$1. \begin{cases} 2x - y = 1 \\ y = 3 \end{cases}$$

$$2. \begin{cases} 3x + 4y = -2 \\ -3x - y = 5 \end{cases}$$

$$3. \begin{cases} \frac{x}{3} - \frac{4y}{5} = \frac{7}{5} \\ \frac{2x}{9} + \frac{y}{3} = \frac{1}{2} \end{cases}$$

$$4. \begin{cases} 2x - 4y = 6 \\ 3x - 6y = 9 \end{cases}$$

$$5. \begin{cases} 6x + 3y = 9 \\ 4x + 2y = 12 \end{cases}$$

$$6. \begin{cases} x - y = 0 \\ x + y = 2 \\ -2x + y = -2 \end{cases}$$

In Exercises 1 - 8, solve the given system using substitution and/or elimination. Classify each system as consistent independent, consistent dependent, or inconsistent. Check your answers both algebraically and graphically.

$$1. \begin{cases} x + 2y = 5 \\ x = 6 \end{cases}$$

$$2. \begin{cases} 2y - 3x = 1 \\ y = -3 \end{cases}$$

$$3. \begin{cases} \frac{x+2y}{4} = -5 \\ \frac{3x-y}{2} = 1 \end{cases}$$

$$4. \begin{cases} \frac{2}{3}x - \frac{1}{5}y = 3 \\ \frac{1}{2}x + \frac{3}{4}y = 1 \end{cases}$$

$$5. \begin{cases} \frac{1}{2}x - \frac{1}{3}y = -1 \\ 2y - 3x = 6 \end{cases}$$

$$6. \begin{cases} x + 4y = 6 \\ \frac{1}{12}x + \frac{1}{3}y = \frac{1}{2} \end{cases}$$

$$7. \begin{cases} 3y - \frac{3}{2}x = -\frac{15}{2} \\ \frac{1}{2}x - y = \frac{3}{2} \end{cases}$$

$$8. \begin{cases} \frac{5}{6}x + \frac{5}{3}y = -\frac{7}{3} \\ -\frac{10}{3}x - \frac{20}{3}y = 10 \end{cases}$$

9. A local buffet charges \$7.50 per person for the basic buffet and \$9.25 for the deluxe buffet (which includes crab legs.) If 27 diners went out to eat and the total bill was \$227.00 before taxes, how many chose the basic buffet and how many chose the deluxe buffet?
10. At The Old Home Fill'er Up and Keep on a-Truckin' Cafe, Mavis mixes two different types of coffee beans to produce a house blend. The first type costs \$3 per pound and the second costs \$8 per pound. How much of each type does Mavis use to make 50 pounds of a blend which costs \$6 per pound?
11. Skippy has a total of \$10,000 to split between two investments. One account offers 3% simple interest, and the other account offers 8% simple interest. For tax reasons, he can only earn \$500 in interest the entire year. How much money should Skippy invest in each account to earn \$500 in interest for the year?

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12. A 10% salt solution is to be mixed with pure water to produce 75 gallons of a 3% salt solution. How much of each are needed?
13. This exercise is a follow-up to Example [A.6.2](#). Work with your classmates to explain why mixing 4 gallons of Sasquatch Sweat™ Energy Drink and 1 gallon of Frooty Giggle Delight™ would also produce a mixture that was “close enough for the Dude-Bros”.