

5.8 Shopping for Cats & Dogs

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Skills: ^{provide evidence}

Prove why $(-5, 7)$ is the solution to the system of equations:

$$y = -\frac{1}{2}x + \frac{9}{2}$$

$$y = -\frac{3}{5}x + 4$$

$$\begin{cases} x + 2y = 9 \\ 3x + 5y = 20 \end{cases}$$

$$-5 + 2(7) = 9$$

$$-5 + 14 = 9$$

$$9 = 9$$

$$3(-5) + 5(7) = 20$$

$$-15 + 35 = 20$$

$$20 = 20$$

$$x = -2y + 9$$

$$3(-2y + 9) + 5y = 20$$

$$x + 2(7) = 9$$

$$-6y + 27 + 5y = 20$$

$$x + 14 = 9$$

$$-1y + 27 = 20$$

$$x = -5$$

$$-1y = -7$$

$$y = 7$$

$$\boxed{(-5, 7)}$$

SECONDARY MATH I / MODULE 1 SYSTEMS OF EQUATIONS AND INEQUALITIES

5.8 Shopping for Cats and Dogs



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A Develop Understanding Task

- One week Carlos bought 3 bags of Tabitha Tidbits and 4 bags of Figma Flakes for \$43.00. The next week he bought 3 bags of Tabitha Tidbits and 6 bags of Figma Flakes for \$54.00. Based on this information, figure out the price of one bag of each type of cat food. Explain your reasoning.
- One week Carlos bought 2 bags of Brutus Bites and 3 bags of Lucky Licks for \$42.50. The next week he bought 5 bags of Brutus Bites and 6 bags of Lucky Licks for \$94.25. Based on this information, figure out the price of one bag of each type of dog food. Explain your reasoning.
- Carlos purchased 6 dog leashes and 6 cat brushes for \$45.00 for Clarita to use while pampering the pets. Later in the summer he purchased 3 additional dog leashes and 2 cat brushes for \$19.00. Based on this information, figure out the price of each item. Explain your reasoning.
- One week Carlos bought 2 packages of dog bones and 4 packages of cat treats for \$18.50. Because the finicky cats didn't like the cat treats, the next week Carlos returned 3 unopened packages of cat treats and bought 2 more packages of dog bones. After being refunded for the cat treats, Carlos only had to pay \$1.00 for his purchase. Based on this information, figure out the price of each item. Explain your reasoning.
- Carlos has noticed that because each of his purchases have been somewhat similar, it has been easy to figure out the cost of each item. However, his last set of receipts has him puzzled. One week he tried out cheaper brands of cat and dog food. On Monday he purchased 3 small bags of cat food and 5 small bags of dog food for \$22.75. Because he went through the small bags quite quickly, he had to return to the store on Thursday to buy 2 more small bags of cat food and 3 more small bags of dog food, which cost him \$14.25. Based on this information, figure out the price of each bag of the cheaper cat and dog food. Explain your reasoning.

5.8. Continued...

$$\begin{array}{r} 1. \quad 3t + 4f = 43 \\ \quad \quad -4f = -22 \\ \hline 3t + 6f = 54 \\ \quad \quad \frac{21}{3} \quad T=7 \end{array} \quad \frac{11}{2} \quad \boxed{f = 5.50}$$

$$\begin{array}{r} 2. \quad 2B + 3L = 42.50 \\ \quad \quad 5B + 6L = 94.25 \\ \quad \quad \rightarrow 4B + 6L = 85 \\ \quad \quad \quad \boxed{B = 9.25 \text{ per bag}} \\ \quad \quad 5(9.25) = 46.25 \\ \quad \quad \quad \frac{94.25}{-46.25} \\ \quad \quad \quad \hline \quad \quad \quad \frac{48.00}{2} \\ \quad \quad \quad \quad \boxed{L = 24.00} \end{array}$$

$$3. \quad 6d + 6c = 45.00$$

$$\begin{array}{r} (2) \quad 3d + 42c = 19.00 \quad (3) \\ \quad \quad 6d + 4c = 38.00 \\ \quad \quad \quad \frac{2c}{2} = \frac{7.00}{2} \\ \quad \quad \quad \quad \boxed{C = 3.50} \end{array}$$

$$\begin{array}{r} 6d + 6(3.50) = 45.00 \\ \quad \quad \quad \frac{21}{21} \quad \quad \quad \frac{21}{21} \\ \quad \quad \quad 6d = 24 \\ \quad \quad \quad \quad \boxed{d = 4.00} \end{array}$$

$$4. \quad 2d + 4c = 18.50$$

$$- \quad 2d - 3c = 1.00$$

$$\begin{array}{r} \frac{7c}{7} = \frac{17.50}{7} \\ \quad \quad \quad \boxed{C = 2.50} \end{array}$$

$$\begin{array}{r} 4(2.50) = 10 \quad \frac{18.50}{-10.00} \\ \quad \quad \quad \hline \quad \quad \quad 8.50 \\ \quad \quad \quad \frac{2d}{2} = \frac{8.50}{2} \\ \quad \quad \quad \quad \boxed{d = 4.25} \end{array}$$

$$5. \quad 3c + 5d = 22.75 \quad (2)$$

$$(1) \quad 2c + 3d = 14.25 \quad (3)$$

$$\begin{array}{r} 6c + 10d = 45.50 \\ - \quad 4c + 9d = 42.75 \\ \hline \quad \quad \quad \boxed{d = 2.75} \end{array}$$

$$\begin{array}{r} 3c + 5(2.75) = 22.75 \\ 3c + 13.75 = 22.75 \\ \quad \quad \quad -13.75 \quad -13.75 \\ \quad \quad \quad \hline \quad \quad \quad 9.00 \\ \quad \quad \quad \frac{3c}{3} = \frac{9.00}{3} \\ \quad \quad \quad \quad \boxed{C = 3.00} \end{array}$$