5.8 Shopping for Cats and Dogs

A Develop Understanding Task

Clarita is upset with Carlos because he has been buying cat and dog food without recording the price of each type of food in their accounting records. Instead, Carlos has just recorded the total price of each purchase, even though the total cost includes more that one type of food. Carlos is now trying to figure out the price of each type of food by reviewing some recent purchases.

As Carlos is examining the first set of purchases he realizes that he can figure out the cost of the individual items just by reasoning about the numbers and the assumption that the price of each item remained the same for each shopping trip. Clarita is surprised that Carlos can find the individual prices without using tables, graphs or algebra.

See if you can reason about these shopping scenarios as well as Carlos by figuring out the cost of each item purchased, without using tables, graphs or equations.

1. One week Carlos bought 3 bags of *Tabitha Tidbits* and 4 bags of *Figaro Flakes* for $43.00. The next week he bought 3 bags of *Tabitha Tidbits* and 6 bags of *Figaro Flakes* for $54.00. Based on this information, figure out the price of one bag of each type of cat food. Explain your reasoning.

2. 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.

3. 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.

$6x+6y=45.00$
$3x+2y=19.00$
$-6x-4y=-38.00$
$2y=7$
$y=3.5$ $x=4$
Dog leash costs $3.50
cat brush costs $4

4. 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.

$y = 2.50$ $2x + 4y = 18.5$ $2x + 4y = 18.5$
$x = 4.25$ $-2x + 3y = -1.00$ $4x + 1y = 19.50$
$7y = 17.50$

5. 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.

$2 \cdot 3c + 5d = 22.75$ $6c + 10d = 45.50$
$3 \cdot 2c + 3d = 14.25$ $-6c - 9d = -42.75$
$d = 2.75$ $c = 3$

Summarize the strategies you have used to reason about the price of individual items in the problems given above. What are some key ideas that seem helpful?