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What's For Lunch? Solving More Systems

Problem Set

Write a system of equations to represent each problem situation. Solve the system of equations using any method. Then, answer any associated questions.

- Jason and Jerry are competing at a weightlifting competition. They are both lifting barbells containing 200 pounds of plates (weights). Jason's barbell has 4 large and 10 small plates on it. Jerry's barbell has 6 large and 5 small plates on it. How much does each large plate and each small plate weigh? Let x represent the weight (in pounds) of a large plate. Let y represent the weight (in pounds) of a small plate.

$$\begin{cases} 4x + 10y = 200 \\ 6x + 5y = 200 \end{cases}$$

One possible solution path:

Linear Combinations Method:

$$\begin{array}{r} 4x + 10y = 200 \\ -2(6x + 5y = 200) \\ \hline 4x + 10y = 200 \\ -12x - 10y = -400 \\ \hline -8x = -200 \\ x = 25 \end{array}$$

$$\begin{array}{r} 4(25) + 10y = 200 \\ 100 + 10y = 200 \\ 10y = 100 \\ y = 10 \end{array}$$

The solution is (25, 10). Each large plate weighs 25 pounds. Each small plate weighs 10 pounds.

2. Rachel needs to print some of her digital photos. She is trying to choose between Lightning Fast Foto and Snappy Shots. Lightning Fast Foto charges a base fee of \$5 plus an additional \$0.20 per photo. Snappy Shots charges a base fee of \$7 plus an additional \$0.10 per photo. Determine the number of photos for which both stores will charge the same amount. Explain which store Rachel should choose depending on the number of photos she needs to print.

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3. Raja is trying to decide which ice cream shop is the better buy. Cold & Creamy Sundaes charges \$2.50 per sundae plus an additional \$0.25 for each topping. Colder & Creamier Sundaes charges \$1.50 per sundae plus an additional \$0.50 for each topping. Determine the number of toppings for which both vendors charge the same amount. Explain which vendor is the better buy depending on the number of toppings Raja chooses.

4. Marcus is selling t-shirts at the State Fair. He brings 200 shirts to sell. He has long-sleeve and short-sleeved T-shirts for sale. On the first day of the fair, he sells $\frac{1}{2}$ of his long-sleeved T-shirts and $\frac{1}{3}$ of his short-sleeved T-shirts for a total of 80 T-shirts sold. How many of each type of T-shirt did Marcus bring to the fair?

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5. Alicia has a booth at the flea market where she sells purses and wallets. All of her purses are the same price and all of her wallets are the same price. The first hour of the day, she sells 10 purses and 6 wallets for a total of \$193. The second hour, she sells 8 purses and 10 wallets for a total of \$183. How much does Alicia charge for each purse and each wallet?

6. Weston wants to buy a one-year membership to a golf course. Rolling Hills Golf Course charges a base fee of \$200 and an additional \$15 per round of golf. Majestic View Golf Course charges a base fee of \$350 and an additional \$10 per round of golf. Determine the number of rounds of golf for which both golf courses charge the same amount. Explain which golf course Weston should become a member at depending on the number of rounds he intends to play.