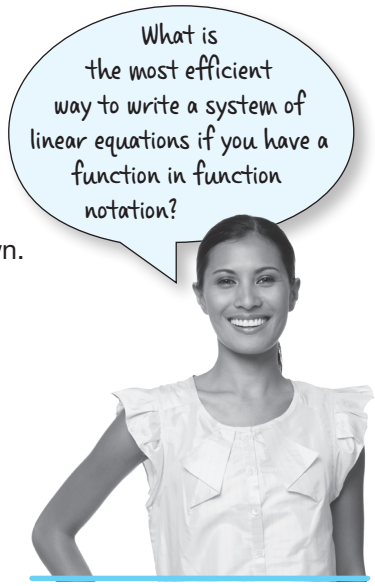
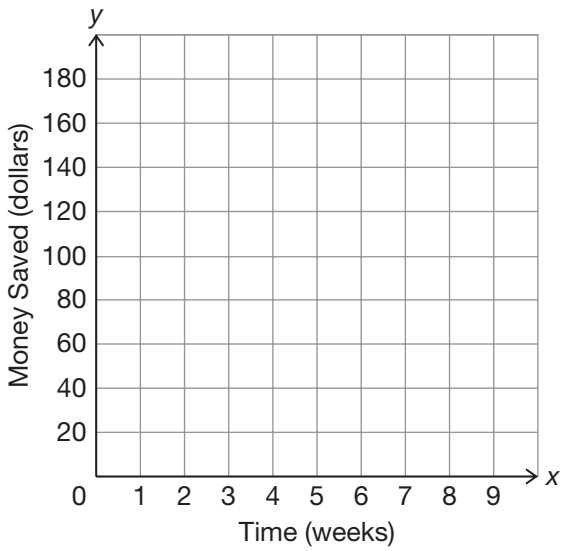
9. Tonya is also in the Robotics Club and has heard about Marcus's and Phillip's savings plans. She wants to be able to buy her new materials before Phillip, so she opens her own bank account. She is able to deposit $40 in her account that she has saved from her job as a waitress. Each week she also deposits $4 from her tips.

a. Write a function that represents the information about Tonya saving money every week. Do not forget to define your variables.

b. Write a linear system to represent the total amount of money Tonya and Phillip have after a certain amount of time.



c. Graph the linear system on the coordinate plane shown.



10. Do the graphs intersect? If so, describe the meaning in terms of this problem situation.

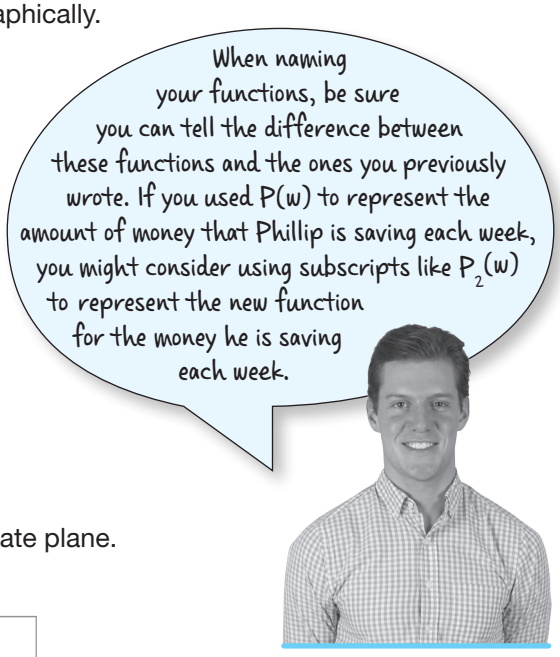
11. Phillip and Tonya went on a shopping spree this weekend and spent all their savings except for $40 each. Phillip is still saving $10 a week from his allowance. Tonya now deposits her tips twice a week. On Tuesdays she deposits $4 and on Saturdays she deposits $6. Phillip claims he is still saving more each week than Tonya.

a. Do you think Phillip's claim is true? Explain your reasoning.

b. How can you prove your prediction?

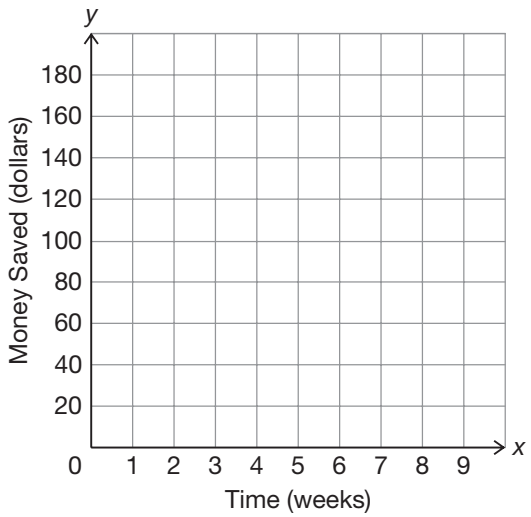
12. Prove your prediction algebraically and graphically.

a. Write functions that represent any new information about the way Tonya and Phillip are now saving money.



b. Write a new linear system to represent the total amount of money each friend has after a certain amount of time.

c. Graph the linear system on the coordinate plane.



13. Analyze the graph.

a. Describe the relationship between the graphs. What does this mean in terms of this problem situation?

b. Algebraically prove the relationship you stated in part (a).

c. Does this solution prove the relationship? Explain your reasoning.

14. Was Phillip's claim that he is still saving more than Tonya a true statement? Explain why or why not.

PROBLEM 3 Transforming Equations: More Than Meets the Eye

Not all systems will be written in slope-intercept form or function notation. Systems can also be written in standard form. Let's explore a system in standard form.

$$\begin{cases} 2x + 8y = 10 \\ 4x = y - 2 \end{cases}$$

Do you think there is more than one way to transform one of the equations in the system to create a new equation with only one unknown?

1. Analyze each student's work.

Dontrell

$\begin{cases} 2x + 8y = 10 \\ 4x = y - 2 \end{cases}$

$2x + 8y = 10$

$4x + 2 = y$

$2x + 8(4x + 2) = 10$

Janelle

$\begin{cases} 2x + 8y = 10 \\ 4x = y - 2 \end{cases}$

$2x = 10 - 8y$

$x = 5 - 4y$

$4(5 - 4y) = y - 2$

Maria

$\begin{cases} 2x + 8y = 10 \\ 4x = y - 2 \end{cases}$

$8y = -2x + 10$ $\quad 4x = y - 2$

$y = -\frac{2}{8}x + \frac{10}{8}$ $\quad 4x + 2 = y$

$-\frac{2}{8}x + \frac{10}{8} = 4x + 2$

a. Describe the method Dontrell used to solve this system of equations and explain why he is correct.