

## Summarize

continued

- What are the advantages (disadvantages) of using one equation rather than two or more equations to represent a situation?
- Does the equation for total money raised represent a linear, exponential, quadratic or none of these relationships? How can you tell? What is the slope? Y-intercept?

Write a few expressions on the board some of which are equivalent.

- Identify the expressions that are not equivalent to any other expression in the list:

$$9x + 3$$

$$2x + 3 + 7x$$

$$2x + 10x$$

$$2(x + 3) + 7x$$

$$3(3x + 1)$$

$$7x + 2x + 3$$

$$2x(3 + 7x)$$

## ACE Assignment Guide for Problem 2.1



Core 2, 3–5, 13–15

Other Applications 1, Connections 16–18, Extensions 38

**Adapted** For suggestions about adapting Exercise 1 and other ACE exercises, see the *CMP Special Needs Handbook*.

**Connecting to Prior Units** 14: *Frogs, Fleas and Painted Cubes*; 15–16: *Say it with Symbols*, Investigation 1; 17–19: *Moving Straight Ahead*

## Answers to Problem 2.1

- A. 1. a.  $M_{\text{Leanne}} = 16(10)$   
 b.  $M_{\text{Gilberto}} = 7(2x)$   
 c.  $M_{\text{Alana}} = 11(5 + 0.5x)$   
 2.  $M_{\text{Total}} = 16(10) + 7(2x) + 11(5 + 0.5x)$   
 or  $160 + 14x + 55 + 5.5x$  or some other equivalent form.

NOTE: The  $x$ 's in the above equations are the same in this context because all three students walk exactly  $x$  kilometers together. If the students had walked different distances, we could not use the same variable  $x$  in the combined  $M_{\text{Total}}$  equation since the  $x$ 's would represent different amounts for each person.

- B. 1.  $M_{\text{Total}} = 160 + 14x + 55 + 5.5x = 215 + 19.5x$   
 2. The 19.5 represents the combined amount of money that Leanne, Gilberto and Alana make at a per kilometer rate. Leanne makes \$10 for each of 16 sponsors, for a total of \$160. Gilberto will raise \$2 per kilometer from each of his 7 sponsors for a total of \$14 per kilometer. Alana will raise \$0.50 per kilometer from each of her 11 sponsors for a total of \$5.50 per kilometer. This results in a total rate of  $14 + 5.5 = 19.5$  per kilometer. The 55 is the amount that Alana collected from her 11 sponsors in addition to her 50-cent rate per kilometer.  
 3. Possible answer: I used the expression that was written in Question B, part (2), because it was the shortest.  
 C. The relationship between kilometers walked and money raised is linear. Students may reason about this by using a graph, a table or by noticing the form of the equation  $M_{\text{Total}} = 215 + 19.5x$  is of the form  $y = mx + b$ .  $m = 19.5$  is the slope and  $b = 215$  is the y-intercept.