In these activities, you will identify efficient strategies for solving linear equations in one variable. After completing the activities, discuss and/or present your findings to the rest of the class.

Activity 1 [Page 1.3]

1. When solving equations—or doing any mathematics—it helps to "look before you leap". For each of the following, think about which strategy would be an efficient and useful way to begin solving the equation. Explain the reasoning behind your choice of strategy.

    a. $2(x-3)=5(2x+1)+3$

    b. $14=4-5x$

    c. $2x-17=4x+25$

    d. $6x=28+5x$

    e. $7-3x=7-3(x-2)$

    f. $\dfrac{3}{8}x-2=5+\dfrac{1}{4}x$

2. Why is it important to look for efficient and even elegant solutions?

3. Use **New** to generate equations to find two equations you think will be interesting to solve by considering "look before you leap". Solve them and be ready to share your thinking with the class.

4. An *identity* is an equation where the right and left sides of the equation are equivalent expressions. Which of each pair is an identity? Explain your reasoning. (If necessary, think about your work on *Building Expressions in Two Variables.*)

   a. $4(x-2)=4x-8$ or $4(x-2)=4x-6$

   b. $2x+3(x-6)=5x-6$ or $x+4(x+2)=3x+2(x+4)$

   c. $15x-10=15x+10$ or $15x-10=5(3x-2)$

5. Sort the following equations into three categories: identities, those that have no possible solution, and those that have exactly one solution. Explain how you decided which equation went to which category.

   a. $3x-5=x+2(x-3)$

   b. $5(x-3)-2(x-3)=0$

   c. $5x-(x-3)=3+4x$

   d. $3(x-4)-x=2(x-6)$

   e. $7x+2(1-x)=2x+4(x-1)$

   f. $2(x+2)+x=3(x-6)$

6. Generate a new equation you like, let *x* be a number, and then describe in words what the equation would be. For example, "I'm thinking of a number so that the product of 3 and 2 less than the number is 21" would produce the equation $3(x-2)=21$. See if your partner can write and solve your equation.