Lesson 7 Practice Problems

1. For each equation, decide if it is always true or never true.

   a. $x - 13 = x + 1$

   b. $x + \frac{1}{2} = x - \frac{1}{2}$

   c. $2(x + 3) = 5x + 6 - 3x$

   d. $x - 3 = 2x - 3 - x$

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

2. Mai says that the equation $2x + 2 = x + 1$ has no solution because the left hand side is double the right hand side. Do you agree with Mai? Explain your reasoning.

3. a. Write the other side of this equation so it's true for all values of x:
    $\frac{1}{2}(6x - 10) - x =$

    b. Write the other side of this equation so it's true for no values of x:
    $\frac{1}{2}(6x - 10) - x =$

4. Here is an equation that is true for all values of x: $5(x + 2) = 5x + 10$. Elena saw this equation and says she can tell $20(x + 2) + 31 = 4(5x + 10) + 31$ is also true for any value of x. How can she tell? Explain your reasoning.

5. Elena and Lin are trying to solve $\frac{1}{2}x + 3 = \frac{7}{2}x + 5$. Describe the change they each make to each side of the equation.

   a. Elena's first step is to write $3 = \frac{7}{2}x - \frac{1}{2}x + 5$.

   b. Lin's first step is to write $x + 6 = 7x + 10$.

   (From Unit 4, Lesson 4.)

6. Solve each equation and check your solution.

   $$3x - 6 = 4(2 - 3x) - 8x \qquad \frac{1}{2}z + 6 = \frac{3}{2}(z + 6) \qquad 9 - 7w = 8w + 8$$

   (From Unit 4, Lesson 6.)

7. The point $(-3, 6)$ is on a line with a slope of 4.

   a. Find two more points on the line.

   b. Write an equation for the line.

   (From Unit 3, Lesson 12.)