Chapter 3
Lesson 3.1

Challenge: Skills and Applications

1. (3, −2)  
2. no common solution

3. a. The solution is (−1, 4). b. Since the equations are in point-slope form, they must pass through the point (−1, 4) regardless of the values of \(a\) and \(b\). Since \(a \neq b\), this point must be the only solution.

4. a. \(y = \frac{1}{3}x - \frac{5}{6}\); \(y = \frac{1}{3}x + \frac{10}{3}\)  
b. The graphs do not intersect (they are parallel).
c. Put the two equations in slope intercept form. If the slopes are different, the system has a unique solution. If the slopes are the same and the y-intercepts are different, the system has no solution. If the y-intercepts are also the same, the system has infinitely many solutions.

5. a. $y + 4 = \frac{1}{2}(x - 3); y - 1 = 3(x - 8)$
   
   b. (7, −2)  
   
   c. $t = 2; t = 1$; no; the particles traveling along the two lines reach the common point (7, −2) at different times.