SECTION 4.4: 1, 2, 3, 6, 34, 35, 38

*1. a. Domain = {4, 5, 6, 7, 8} codomain = {8, 9, 10, 11} range = {8, 9, 10} 
   b. 8, 10 
   c. 6, 7 
   d. no, no 

2. (a) is a function, one-to-one but not onto 
   (b) is not a function 
   (c) is a one-to-one, onto function 
   (d) is an onto function but not one-to-one 

3. a. {(0, -1), (1, 1), (2, 3)} 
   b. {(1, 1), (2, 3), (4, 7), (5, 9)} 
   c. { (√7, 2√7 - 1), (1.5, 2)} 

6. a. not a function from S to T (not a subset of S x T) 
   b. function 
   c. function; one-to-one and onto 
   d. not a function from S to T (0 has no associated value) 
   e. not a function (two values associated with 0) 

*34. a. 3^4 
   b. 36 

35. a. 4^3 
   b. 4! 

38. a. This is the number of onto functions from a set of 5 elements to a set of 3, which is 150. 
   b. If Maria does additional tasks, then the mapping from the test plan development to Maria is already determined, leaving the remaining 4 tasks to be assigned to 3 workers with each worker getting at least one task. This number is 36. If Maria does no additional task, then the mapping from the test plan development to Maria is already determined, leaving the remaining 4 tasks to be assigned to 2 workers with each worker getting at least one task. This number is 14. By the Addition Principle, the total number of outcomes is 36 + 14 = 50.