Quiz 3

1. Fill in the blanks in the following proof:

   Theorem 1. *If x is a positive integer and x^3 is even, then x is even.*

   Proof: Proof by contrapositive.
   Assume that x is a positive integer and _____.

   We will prove that _____.

   If x is odd, then it can be written as _____ for some integer k.

   Plug in the expression for x into x^3 to get _____.

   The expression for x^3 can be written as

   _____

   Since _____ is an integer, we can conclude that x^3 is odd.

   ∎

2. Suppose you were to prove the following theorem:

   Theorem 2. *If $0 \leq x \leq 3$, then $15 - 8x + x^2 > 0$.*

   (a) In a direct proof, what would you assume and what would you prove?

   (b) In a proof by contrapositive, what would you assume and what would you prove?