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?