Worksheet on Negating for Contradiction

October 21, 2015

For each of the following theorems, set up for proof by contradiction by making your first assumptions.

1. The integer 3 is odd.

2. The integer 3 is negative.

3. All integers have non-negative squares.

4. There exists an integer that is even.

5. At least one of the first seven integers is even.

6. If $b \geq 1$, then $b^2 \geq 1$.

7. If X is a wobble, then X is a tobble.

8. If a is real, then $a^2 \geq 0$.

9. Suppose a and b are integers. Then $a^2 + b^2 \geq 0$.

10. Let $k \in \mathbb{Z}$. Then at least one of k or $k + 1$ is even.

11. Let $k \in \mathbb{Z}$, and suppose $k \geq 1$. Then both $k+1$ and $k+2$ are greater than 1.

12. Whenever x is an even integer, x^2 is an even integer.

13. If x is an even integer, then every integer $y > x$ is either even or odd.

14. If every integer is even, then every integer is either even or odd.

15. If every integer is odd, then there exist at least two odd integers.

16. If $n \in \mathbb{Z}$ is positive, and $k \geq n + 1$ objects are placed into n boxes, then at least one box contains at least two objects.