**1.**   
The sum of an even number and odd number is odd.

The product of two odd numbers is odd.

The square of an even number is even.

**2.**

Show that does not have positive integer solutions.

or

**3.**

Prove by Mathematical Induction that for any positive integer number is divisible by 3.

Step 1. Show that is divisible by 3 when

, 3 is divisible by3.

Step 2. Assume = 3m is true for

Step 3. Prove is true for

for

h. n.

**4.**

Step 1. Show that is the sum of the squares from 1 to n when n = 1.

Step 2. Assume is true for an integer k.

Step 3. Prove it’s also true when

**5.**

False

True

True

True

True

True

True

False

**6.**

{3, 5}

{7, 9}

{{8}, {7, 8}, {8, 9}, {7, 8, 9}}

{{3}, {3, 5}, {7}}