Chapter 1

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Theorem 4. The sum of two odd numbers is even.

Proof. Recall the definition of an odd number to be a number, n, that can be written as 2k-1 where k is an integer. Recall also that the definition of an even number is a number, m, that can be written as 2j-1 where j is an integer. Let $n_1 = |2k-1|$ and $n_2 = |2j-1|$. By adding these two we get $2k-1+2j-1$ which turns into $2k+2j-2$. By factoring out the 2 we receive $2(k+j-1)$. □

Result. Thus, since k and j are integers, subtracting 1 still results in an integer. Therefore we can rewrite $2k+j-1$ as m. Therefore, we are left with the definition of an even number, ergo 2m.

Theorem 7. Every binary number n that ends in 0 is even

Proof. □

Result.

Theorem 10. The difference of two consecutive perfect squares is odd

Proof. □

Result.

Theorem 17. At least two flights at Chicaog O'Hare International AIrport must take off within 90 seconds of each other

Proof. □

Result.

Theorem 22a.

Proof. □

Result.

Theorem 22b.

Proof. □

Result.

Theorem 23. If n is any integer, then $3n^3 + n + 5$ is odd.

Proof. □

Result.