This is a document.

According to Pythagoras, if a and b are the lengths of the sides of a right triangle and c is the length of its hypotenuse, then

$$c^2 = a^2 + b^2$$

An important theorem is the following:

Crazy Conjecture 1. *If n is an even number, then $4n$ is also an even number.*

Proof. We assume n is an even number, and show that $4n$ is also an even number. Since n is even, we can write it as $n = 2a$, where a is an integer. Then

$$
\begin{aligned}
4n &= 4(2a) \\
&= 2(4a)
\end{aligned}
$$

Since integers are closed under multiplication, we see that $4n$ is twice some integer, i.e., $4n$ is even. We have thus shown that if n is an even number, then $4n$ is also an even number. $\square$