Claim 1 *For all $n \in N$, $n^2 + 6n + 7 < 20n^2$*

Proof By Induction 1 *Base Case, (n=1)* $1^2 + (6)1 + 7 = 14 < 20 = (10)1 = (20)1^2$
Inductive Step: Let n be a natural number. Assume $n^2 + 6n + 7 < 20n^2$
$(n+1)^2+6(n+1)+7 = n^2+2n+1+6n+6+7 = n^2+6n+7+2n+7 < 10n^2+2n+7$

$$
\begin{aligned}
&20n^2 + 2n + 7 \\
&< 20n^2 + 40n + 7 \\
&< 20n^2 + 40n + 20 \\
&= 20(n^2 + 2n + 1) \\
&= 20(n + 1)^2
\end{aligned}
$$

So $(n + 1)^2 + 6(n + 1) + 7 < 20(n + 1)^2$ *By proof of mathematical inductionm this concludes the proof.*