MTH 331 – Statement 1

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Statement 0. *Let n be an integer. If $n \geq 3$ then $n^3 > (n+1)^2$*

Proof. For $n \geq 3$, $n-2 \geq 1$ and $n+1 \geq 4$
so $n(n-2)(n+1) \geq 3 \cdot 4 \cdot 1 = 12 > 1$
$n(n-2)(n+1) > 1$
$n^3 - n^2 - 2n > 1$
$n^3 > n^2 + 2n + 1$
$n^3 > (n+1)^2$

□