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Solution for Problem J373

$$a^2+b^2+2=a^2+b^2+1+1=a^2+1+b^2+1\geq\frac{(a+1)^2}{2}+\frac{(b+1)^2}{2}\geq 2\sqrt{\frac{(a+1)^2(b+1)^2}{4}}=(a+1)(b+1)$$

whereby the inequalities are true by direct application of the AM-GM inequality.
Therefore we get that:

$$(a^2+b^2+2)(b^2+c^2+2)(c^2+a^2+2)\geq(a+1)(b+1)(b+1)(c+1)(c+1)(a+1)=(a+1)^2(b+1)^2(c+1)^2$$

Since $a^2+1\geq\frac{(a+1)^2}{2}$ is true for all $a\geq-1$,we conclude that the inequality holds for all real $a,b,c\geq-1$