**Question**
Solve the equation

$$(x+ia)62n+(x-ia)^{2n}=(x^2+a^2)^n$$

**Answer**
Assumption $x$ and $a$ are real $x+ia=re^{i\theta}$
$(r^2e^{2i\theta})^n+(r^2e^{-2i\theta})^n=(r^2)^n$

If $r\neq 0$
$e^{2ni\theta}+e^{-2ni\theta}=1$
i.e. $\cos 2n\theta=\frac{1}{2}$
$\theta=\left(\frac{2k}{n}+\frac{1}{6n}\right)\pi \quad k=0,1,2,..,2n-1$

If $r=0$
then $a=0$ so the equation becomes $x^{2n}+x^{2n}=x^{2n}\Rightarrow x=0$