

You solved the inequality $|2z + 4| \leq 8$, instead of $|2z + 4| \geq 8$. If $|X| \geq 8$, then $X \geq 8$ or $X \leq -8$. In this problem X is $2z + 4$. This means that you have to solve two inequalities: $2z + 4 \geq 8$ and $2z + 4 \leq -8$.