If there are only even numbers in the set then all subsets sum to even number. There are 2^N subset overall including empty subset. Thus, with empty subset excluded we have

$$X=2^N-1$$

If there are odd numbers in the set they must be considered as pairs, fours, etc.: only sums of even number of odd numbers is even. Let the number of even numbers in the set be N_e and the number of odd numbers be N_o: $N_e + N_o = N$.

We can choose C^2_{No} pairs from N_o numbers, C^4_{No} fours, C^6_{No} sixes, etc. Overall we can choose

$$\sum_{k=2,\, k \bmod 2=0}^{N_o} C_{N_o}^k$$

even counts of odd numbers. Thus total number of even subsets is:

$$X=(2^{N_e}-1)+(2^{N_e}-1)\cdot\sum_{k=2,\, k \bmod 2=0}^{N_o} C_{N_o}^k+\sum_{k=2,\, k \bmod 2=0}^{N_o} C_{N_o}^k$$

Because

$$\sum_{k=0}^{N} C_N^k=2^N$$

we have

$$\sum_{k=2,\, k \bmod 2=0}^{N_o} C_{N_o}^k=\frac{2^{N_o}}{2}-C_{N_0}^0=2^{N_o-1}-1$$

(we must get rid of half of choose terms and C^0_{No}).

Then

$$X=(2^{N_e}-1)+(2^{N_e}-1)\cdot(2^{N_o-1}-1)+(2^{N_o-1}-1)=(2^{N_e}-1)\cdot(1+2^{N_o-1}-1)+2^{N_o-1}-1=.$$

$$.=(2^{N_e}-1)\cdot 2^{N_o-1}+2^{N_o-1}-1=2^{N_o-1}\cdot(2^{N_e}-1+1)-1=2^{N_o-1}\cdot 2^{N_e}-1=2^{N_o+N_e-1}-1=2^{N-1}-1$$

As a result we have

$$X=2^{N-1}-1.$$