Question 7.

proof. By induction on n,

For the smallest natural number 0/1.

$$\sum_{i=1}^{1} 2^i = 2^{1+1} - 2$$

this holds for $n=1$.

we want to show that if n holds, then $n+1$ also holds.

$$2 + 2^2 + 2^3 + \cdots 2^n + 2^{n+1} = 2^{n+1} - 2 + 2^{n+1}$$

$$= 2 \cdot 2^{n+1} - 2$$

$$= 2^{(n+1)+1} - 2.$$

thus this is proven by induction