Question

With induction:

1) We have: $n=1:\ 2^{3\cdot 1}-1=8-1=7$ divide by 7.
2) Let take that when $n=k:\ 2^{3k}-1$ divide by 7 $\Rightarrow 2^{3k}-1=7m$.
3) And when:

$$n=k+1:\ 2^{3k+3}-1=8\cdot 2^{3k}-1=8\cdot 2^{3k}-8+7=8\cdot\left(2^{3k}-1\right)+7=$$

$$=8\cdot 7m+7=7\cdot\left(8m+1\right)\Rightarrow \text{ divide by 7.}$$

So, we proved that 7 divides $2^{3n}-1$.

Answer: Proved.