2.59
a)

$n=1 \qquad 1 \leq \frac{1}{4}(5-1)$ ✓

$n=k \qquad 1+\frac{1}{2^3}+\dots+\frac{1}{n^3} \leq \frac{1}{4}\left(5-\frac{1}{n}\right)$

$n=k+1 \qquad \underbrace{1+\frac{1}{2^3}+\dots+\frac{1}{n^3}}+\frac{1}{(n+1)^3} \overset{?}{\leq} \frac{1}{4}\left(5-\frac{1}{n+1}\right)$

$$\frac{1}{4}\left(5-\frac{1}{n}\right)+\frac{1}{(n+1)^3} \overset{?}{\leq} \frac{1}{4}\left(5-\frac{1}{n+1}\right)$$

VL

$$-\frac{1}{4n}+\frac{1}{(n+1)^3} \overset{?}{\leq} -\frac{1}{4(n+1)}$$

$$\frac{1}{(n+1)^3} \overset{?}{\leq} \frac{1}{4n}-\frac{1}{4(n+1)}$$

$$\frac{1}{(n+1)^3} \overset{?}{\leq} \frac{n+1-n}{4n(n+1)}$$

$$4n(n+1) \overset{?}{\leq} (n+1)^3 \quad / : (n+1)$$

$$4n \leq (n+1)^2$$

$$4n \leq n^2+2n+1$$

$$0 \leq n^2-2n+1$$

$$0 \leq (n-1)^2$$