$\frac{15+6+5+1}{30}$

No.

Date / /

$\frac{9}{10} = \frac{1}{2} + \frac{1}{3} + \frac{1}{15}$, $\Rightarrow \frac{a}{b} \overset{?}{=} \sum_{i \in I} \frac{1}{n_i}$ (? decomposition)

proof: ① $\frac{1}{n} = \frac{1}{n+1} + \frac{1}{n(n+1)} = \frac{1}{n+1}\left(\frac{n+1}{n}\right) = \frac{1}{n}$ ... ①

② set $\frac{a}{b} = \underbrace{\frac{1}{b} + \cdots + \frac{1}{b}}_{a \text{ times}} \overset{①}{=} \frac{1}{b} + \left[\frac{1}{b+1} + \frac{1}{b(b+1)}\right] + \cdots + \left[\frac{1}{b+1} + \frac{1}{b(b+1)}\right]$

$= \frac{1}{b} + \underset{I_1}{\frac{a-1}{b+1}} + \underset{I_2}{\frac{a-1}{b(b+1)}}$

$I_1$: $\frac{a-1}{b+1} = \frac{1}{b+1} + \left(\frac{1}{b+2} + \frac{1}{(b+1)(b+2)}\right)(a-2)$

$I_2$: $\frac{a-1}{b_0} = \frac{1}{b_0+1} + \left[\frac{1}{b_0+1} + \frac{1}{b_0(b_0+1)}\right](a-2)$

So at most $(a-1)$ steps can we get $\frac{a}{b} = \sum_{i \in I} \frac{1}{n_i}$. □

For ~~$\frac{9}{10} = \frac{1}{10} + \left(\frac{1}{11} + \frac{1}{10 \times 11}\right) \times 8$~~ $=$ $\frac{9}{10} = \frac{1}{2} + \frac{2}{5}$, $\frac{2}{5} = \frac{1}{5} + \left(\frac{1}{6} + \frac{1}{30}\right)$

$\frac{9}{10} = \frac{1}{2} + \frac{1}{5} + \frac{1}{6} + \frac{1}{30}$