

$f(n) = \begin{cases} \log_8 n & ; \log_8 n \text{ is rational} \\ 0 & ; \text{otherwise} \end{cases}$

$\frac{55}{3}$

complete $\sum_1^{2009} f(n)$

$\frac{1}{3} + \frac{2}{3} + \frac{3}{3} + \frac{4}{3} + \frac{5}{3} + \frac{6}{3} + \frac{7}{3} + \frac{8}{3} + \frac{9}{3} + \frac{10}{3}$

establish what problem is asking

$8^? = n \rightarrow$ is ? rational, it counts. Otherwise it's just a \emptyset .

Keep in mind $8 \rightarrow 2^3$

<p style="color: yellow;"> $8^? = 1 \rightarrow 0$ $8^? = 2 \rightarrow 2^{2^?} = 2^1 \rightarrow ? = \frac{1}{3}$ $8^? = 3$ $8^? = 4 \rightarrow 2^{3^?} = 2^2 \rightarrow ? = \frac{2}{3}$ $8^? = 8 \rightarrow ? = 1$ </p>	<p style="color: yellow;"> $8^? = 16 \rightarrow 2^{3^?} = 2^4 \rightarrow ? = \frac{4}{3}$ pattern established... $32 \rightarrow \frac{5}{3}$ $64 \rightarrow 2$ $128 \rightarrow \frac{7}{3}$ $256 \rightarrow \frac{8}{3}$ $516 \rightarrow 3$ $1032 \rightarrow \frac{10}{3}$ </p>
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