

This book has permission to use the "N&K method of COLORS".

13) Question: Find the value of $\frac{1}{\frac{1}{p+10} + \frac{1}{p+20}}$

- A) $\frac{2p+30}{p^2+30p+200}$ Change ?
 B) $\frac{p^2+30p+200}{2p+30}$
 C) $2p + 30$
 D) $p^2 + 30p + 200$

For speed, while solving something similar, only THINK the words in blue; WRITE only the words in other COLORS.

Solution:

Given 1) $\frac{1}{\text{fraction1} + \text{fraction2}}$

Road Map of Solution:

First, Simplify just the denominator by itself. i.e. Find the value of (fraction1+fraction2)

Second, Substitute the denominator in the original expression. Then, find its value.

First, Simplify the denominator by itself.

$$\begin{aligned} & \frac{1}{p+10} + \frac{1}{p+20} \\ = & \frac{1}{p+10} + \frac{1}{p+20} \\ = & \frac{1}{(p+10)} + \frac{1}{(p+20)} \\ = & \frac{1}{(p+10)} \times \frac{(p+20)}{(p+20)} + \frac{1}{(p+20)} \times \frac{(p+10)}{(p+10)} \\ = & \frac{1 \times (p+20)}{(p+10) \times (p+20)} + \frac{1 \times (p+10)}{(p+20) \times (p+10)} \\ = & \frac{(p+20)}{(p+10) \times (p+20)} + \frac{(p+10)}{(p+20) \times (p+10)} \\ = & \frac{(p+20)}{(p+10) \times (p+20)} + \frac{(p+10)}{(p+10) \times (p+20)} \\ = & \frac{(p+20) + (p+10)}{(p+10) \times (p+20)} \\ = & \frac{p+20 + p+10}{(p+10) \times (p+20)} \\ = & \frac{2p+30}{(p+10) \times (p+20)} \\ = & \frac{2p+30}{[(p+10) \times (p)] + [(p+10) \times (20)]} \\ = & \frac{2p+30}{(p^2+10p) + (20p+200)} \\ = & \frac{2p+30}{p^2+10p + 20p+200} \\ = & \frac{2p+30}{p^2+30p + 200} \end{aligned}$$

So, $\frac{1}{p+10} + \frac{1}{p+20} = \frac{2p+30}{p^2+30p+200}$ Answer(A)

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Therefore,

$$\frac{1}{\left(\frac{1}{p+10} + \frac{1}{p+20}\right)} = \frac{1}{\left(\frac{2p+30}{p^2+30p+200}\right)}$$

$$\frac{1}{\left(\frac{1}{p+10} + \frac{1}{p+20}\right)} = \frac{p^2+30p+200}{2p+30} \dots\dots\dots \text{Answer } ()$$