Bài 5 trang 68 SGK Giải Tích Lớp 12:

a) Cho $a = \log_{30}3$; $b = \log_{30}5$

Hãy tính $\log_{30}1350$ theo a, b.

b) Cho $c = \log_{15}3$. Hãy tính $\log_{25}15$ theo c.

Hướng dẫn giải chi tiết:

a) $\log_{30}1350 = \log_{30}\left(30.3^2.5\right)$

$= \log_{30}30 + \log_{30}3^2 + \log_{30}5$ Do đó:

$= \log_{30}30 + 2.\log_{30}3 + \log_{30}5$ $\log_{25}15$

$= 1 + 2a + b.$ $= \log_{5^2}15 = \frac{1}{2}\log_5 15$

b) Ta có: $c = \log_{15}3$ $= \frac{1}{2}.\log_5(3.5)$

$\Rightarrow \frac{1}{c} = \log_3 15 = \log_3(3.5)$

$= \log_3 3 + \log_3 5 = 1 + \log_3 5$ $= \frac{1}{2}.(\log_5 3 + \log_5 5)$

Do đó, $\log_3 5 = \frac{1}{c} - 1 = \frac{1-c}{c}$. $= \frac{1}{2}\left(\frac{c}{1-c} + 1\right) = \frac{1}{2(1-c)}$

$\Rightarrow \log_5 3 = \frac{c}{1-c}$

Kiến thức áp dụng:

$+ \log_a b^{\alpha} = \alpha.\log_a b;$

$+ \log_{a^{\alpha}} b = \frac{1}{\alpha}.\log_a b$

$+ \log_a (b.c) = \log_a b + \log_a c$

$+ \log_a b = \frac{1}{\log_b a}$