(0)

$c^a c^b = c^{a+b}$ $\frac{c^a}{c^b} = c^{a-b}$ $(c^a)^n = c^{an}$

$a^x = b$ $x = log_a b$

(1)

$c^a = x$ $c^b = y$

$a = log_c x$ $b = log_c y$

$xy = c^{a+b}$ $a + b = log_c xy$ $\therefore log_c x + log_c y = log_c xy$

(2)

$c^a = x$ $c^b = y$

$a = log_c x$ $b = log_c y$

$\frac{x}{y} = c^{a-b}$ $a - b = log_c \frac{x}{y}$ $\therefore log_c x - log_c y = log_c \frac{x}{y}$

(3)

$c^a = x$ $a = log_c x$

$x^n = c^{an}$ $an = log_c x^n$ $\therefore log_c x^n = n\, log_c x$

(4)

$log_a b = x$ $a^x = b$

$log_c a^x = log_c b$ $x\, log_c a = log_c b$ $\therefore log_a b = \frac{log_c b}{log_c a}$

(5)

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

(6)

$$a^{\log_b c} = x$$

$$\log_b c = \log_a x$$

$$\frac{\log_c c}{\log_c b} = \frac{\log_c x}{\log_c a} \qquad \frac{1}{\log_c b} = \frac{\log_c x}{\log_c a}$$

$$\log_c x = \frac{\log_c a}{\log_c b} \qquad \log_c x = \log_b a$$

$$\therefore a^{\log_b c} = c^{\log_b a}$$