

NEW FORMULA 3.747.3

The original formula is

$$\int_0^{\infty} \frac{x \, dx}{(x^2 + b^2) \sin(ax)} = \frac{\pi}{2 \sinh(ab)}$$

the change of variable $t = ax$ and replacing ab by a (and going back to x as the integration variable) gives the new formula

$$\int_0^{\infty} \frac{x \, dx}{(x^2 + a^2) \sin x} = \frac{\pi}{2 \sinh a}$$