

### NEW FORMULA 4.111.6

The original formula is

$$\int_0^{\infty} x \frac{\cos 2ax}{\sinh \beta x} dx = \frac{\pi^2}{4\beta^2} \frac{1}{\cosh^2\left(\frac{a\pi}{\beta}\right)}$$

Let  $t = \beta x$  and replace  $a/\beta$  by  $a$  and go back to  $x$  as the integration variable to obtain

$$\int_0^{\infty} \frac{x \cos 2ax}{\sinh x} dx = \frac{\pi^2}{4} \frac{1}{\cosh^2(\pi a)}$$