PROOF OF FORMULA 3.478.1

\[ \int_0^\infty x^{\nu-1} e^{-\mu x^p} \, dx = \frac{1}{p^{\nu/p}} \Gamma \left( \frac{\nu}{p} \right) \]

Let \( t = \mu x^p \) to obtain

\[ \int_0^\infty x^{\nu-1} e^{-\mu x^p} \, dx = \frac{1}{p^{\nu/p}} \int_0^\infty t^{\nu/p-1} e^{-t} \, dt. \]

The last integral is recognized as the value \( \Gamma \left( \frac{\nu}{p} \right) \).