

$$\int_0^{\infty} \frac{x^2}{e^x + 1} dx = \frac{3}{2} \zeta(3) \quad (1)$$

$$\int_0^{\infty} \frac{x^2}{e^x - 1} dx = 2 \zeta(3) \quad (2)$$

$$\int_0^{\infty} \frac{x^3}{e^x + 1} dx = \frac{7\pi^4}{120} \quad (3)$$

$$\int_0^{\infty} \frac{x^3}{e^x - 1} dx = \frac{\pi^4}{15} \quad (4)$$

$$\int_0^{\infty} \frac{x^2}{e^{ax-b} + 1} dx - \int_0^{\infty} \frac{x^2}{e^{ax+b} + 1} dx = \frac{b^3}{3a^3} + \frac{\pi^2 b}{3a^3} \quad (5)$$

$$\int_0^{\infty} e^{-ax^2} dx = \frac{\sqrt{\pi}}{2\sqrt{a}} \quad (6)$$

(taking the derivatives with respect to  $a$  gives the  $x^{2n}e^{-x^2}$  integrals)

$$\hbar = c = k = 1$$

$$1 \text{ eV} = 11600 \text{ K} = 5.07 \times 10^6 \text{ m}^{-1} = 1.52 \times 10^{15} \text{ s}^{-1} = 1.78 \times 10^{-36} \text{ kg} = 1.6 \times 10^{-19} \text{ J}$$

$$m_{Pl} = 1/\sqrt{G} = 1.22 \times 10^{19} \text{ GeV}$$

$$G = 6.67 \times 10^{-11} \text{ m}^3 / (\text{kg} * \text{s}^2)$$

$$1 \text{ AU} = 1.49 \times 10^{11} \text{ m}, 1 \text{ parsec} = 3.08 \times 10^{16} \text{ m}, M_{\odot} = 1.99 \times 10^{30} \text{ kg}$$