

$$\frac{4\pi}{\pi^{3/2}} \left(\frac{m}{2\pi RT} \right)^{3/2} \left(\frac{m}{RT} \right)^{1/2} \left(\frac{RT}{m} \right)^{1/2}$$

$$\frac{m v}{RT} dv = du$$

$$u = \sqrt{\frac{u^2 RT}{m}}$$

$$u = \frac{m v^2}{2RT}$$

$$u = \frac{u^2 RT}{m}$$

$$\left(\frac{m}{2RT} \right)^{1/2} \cdot \frac{RT}{m}$$

$$\frac{4\pi}{(2\pi)^{3/2}} \cdot \frac{m}{RT} \cdot \frac{2RT}{m}$$

$$\frac{8\pi}{(2\pi)^{3/2}} \int_0^{\infty} \sqrt{u} e^{-u} du$$

$$v = \sqrt{u} \quad dw = e^{-u}$$

$$\frac{e^{-u}}{\sqrt{u}} \xrightarrow{x^2=u} e^{-x^2}$$