May 17

Evaluate the given expressions and solve the given equation.

1. $\displaystyle\int_{0}^{\infty} x^6 e^{-2x}\,dx$

2. $\displaystyle\int_{0}^{\infty} \sqrt{y}\,e^{-y^3}\,dy$

3. $\displaystyle\int_{0}^{1} \sqrt{\frac{1-x}{x}}\,dx$

4. $\displaystyle\int_{0}^{1} \frac{1}{\sqrt{-\ln x}}\,dx$

5. $\displaystyle\int_{0}^{x} (x-t)^{1/4} y(t)\,dt = x + x^2$