

Example 1.

(a) $\frac{1}{3}xe^{3x} - \frac{1}{9}e^{3x} + C$

(b) $\frac{1}{4}x^4 \ln x - \frac{1}{16}x^4 + C$

(c) $\frac{1}{6}e^3 - \frac{1}{6}$

(d) $2 \ln \left| \frac{x-1}{2x-1} \right| + C$

(e) $\frac{1}{5}(2x+9)^{5/2} - 3(2x+9)^{3/2} + C$

(f) $\frac{1}{2}(\ln x)^2 + C$

(g) $\frac{1}{6}(2x^2+9)^{3/2} + C$

(h) $2 \ln 2 - 1$

Example 2.

$$w = 9e^{-.1t} + te^{-.1t} + 11$$

Example 3.

Solving the differential equation, we get that

$$Q(x) = 2 \ln \left| \frac{x+5}{5-x} \right| + C.$$

Thus, the total change in intensity is

$$Q(4) - Q(1) = 2 \ln 6.$$