

Q8

$$(a) \int_0^8 \left(\frac{1}{8} + \frac{1}{2}w \right) dw$$

$$\int_0^8 \left(\frac{1}{8} + \frac{1}{2}w \right) dw = \left[\frac{1}{8}w + \frac{1}{4}w^2 \right]_0^8$$

$$= \left[\frac{1}{8}(8) + \frac{1}{4}(8)^2 \right] = 1 + 16 = 17.$$

$$= \underline{\underline{17}}$$

$$(b) \int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \csc(6t) dt.$$

$$\text{Let } u = \csc(6t)$$

$$= \int_2^1 -1 du$$

$$= -[(-1)u]^2,$$

$$= -[-u]^2,$$

$$= -[-(2-1)] = -[-1] = \underline{\underline{1}}$$

$$(c) \int_0^1 (5x - 5^x) dx.$$

$$= \int_0^1 5x dx - \int_0^1 5^x dx.$$

$$\int_0^1 5x dx = \left[\frac{5x^2}{2} \right]_0^1 = \frac{5}{2}.$$

$$\int_0^1 5^x dx = \left[\frac{5^x}{\ln(5)} \right]_0^1 = \frac{5}{\ln 5} - \frac{1}{\ln 5} = \frac{4}{\ln 5}$$

$$= \frac{5}{2} - \frac{4}{\ln 5} =$$