

$$1) \int_1^4 (\ln t) \sqrt{t} dt = \ln t \cdot \frac{2}{3} t^{3/2} \Big|_1^4 = (\ln 4 \cdot 8 - \ln 1 \cdot 1) = (\ln 4 \cdot 8 - 0)$$

$$\left(\frac{2}{3} \ln 4 \cdot 8 + C \right) - \frac{2^4}{3} = \frac{1}{3} (16 \ln 4 - 16) \quad \checkmark$$

$$3) \int \frac{10}{(n-1)(n^2+9)} = \int \frac{1}{(n-1)} + \frac{-n^{-1}}{(n^2+9)} = \ln |n-1| - \frac{1}{2} \ln |n^2+9| + C \quad \checkmark$$

$$5a) \int_1^4 \sqrt{1+3y^2} dy \quad \checkmark$$

$$5b) \int_0^{\pi/2} 2\pi a \sin^3 t \sqrt{(a_3 \cos^2 t)^2 + (a_3 \sin^2 t)^2} dt \quad \checkmark$$