

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Evaluate $\int \sqrt{4-t} dt$.

$$= - \int \sqrt{u} du$$

$$= - \int u^{1/2} du$$

$$= - \frac{2}{3} u^{3/2} + C$$

$$= \boxed{- \frac{2}{3} (4-t)^{3/2} + C}$$

let $u = 4-t$

$$\frac{du}{dt} = -1$$

$$-du = dt$$

check:

$$\frac{2}{3} \cdot -\frac{2}{3} (4-t)^{1/2} \cdot -1$$

$$= \sqrt{4-t}$$

Well done

2. Evaluate $\int \frac{1}{x(\ln x)^2} dx$.

let $\ln x = u$. Then $\frac{du}{dx} = \frac{1}{x}$.
 $dx = du(x)$.

plug in for the dx

$$\int \frac{1}{x u^2} \cdot du(x)$$

$$= \int u^{-2} \cdot du$$

$$= -u^{-1} + C. \text{ Then plug in the } u.$$

$$\boxed{-\frac{1}{\ln|x|} + C}$$

Excellent!