2a) $\int \ln(2x+3)\,dx$ $\quad \begin{cases} u = 2x+3 \\ dx = \frac{1}{2}du \end{cases}$

$= \int \ln(u) \cdot \frac{1}{2}\,du$

$= \frac{1}{2}\int \ln u\,du$

$= \frac{1}{2}\int \underbrace{1}_{f'} \cdot \underbrace{\ln u}_{g}\,du$

$=$ 

$= \frac{1}{2}\left(\underbrace{u}_{f}\cdot\underbrace{\ln u}_{g} - \int \underbrace{u}_{f}\cdot\underbrace{\frac{1}{u}}_{g'}\,du\right)$

$= \frac{1}{2}\left(u\ln u - \int 1\,du\right)$

$= \frac{1}{2}\left(u\ln u - u\right)$

$= \frac{1}{2}\left((2x+3)\ln(2x+3) - (2x+3)\right)$

$= \frac{1}{2}(2x+3)\left(\ln(2x+3) - 1\right)$