$$\int \tfrac{1}{3} \times u^{\frac{1}{2}} \, du$$

$$\tfrac{1}{3} \int u^{\frac{1}{2}} \, du$$

$$= \tfrac{1}{3} \times \frac{u^{\frac{1}{2}+1}}{\frac{1}{2}+1} + C$$

$$= \tfrac{1}{3} \times \tfrac{2}{3} u^{\frac{3}{2}} + C$$

$$= \tfrac{2}{9} u^{\frac{3}{2}} + C$$

$$= \tfrac{2}{9} (3t^2 - 1)^{\frac{3}{2}} + C \; //$$

(2) $\int 2t \times (3t^2 - 1)^{1/2}$

$y = 3t^2 - 1$

$\frac{dy}{dt} = \frac{6t}{6t}\, dt$

$dt = \frac{dy}{6t}$

$\int 2t \times (y)^{1/2} \frac{dy}{6t - 3}$

5 $\int \frac{2x}{(4x^2-1)^{1/2}} = \int 2x(4x^2-1)^{-1/2}\,dx$

$u = 4x^2 - 1$

$du = 8x\,dx$

$dx = \frac{du}{8x}$

$= \int 2x\,(u)^{-1/2}\,\frac{du}{8x}$

$= \frac{1}{4}\int u^{-1/2}\,du$

$= \frac{1}{4} \times \frac{u^{-1/2+1}}{-1/2+1}$

$= \frac{1}{4} \times \frac{u^{1/2}}{1/2}$

$= \frac{1}{4} \times 2u^{1/2}$

$= \frac{1}{2}u^{1/2} = \frac{1}{2}(4x^2-1)^{1/2}$ //

1) $\int 4\sec^2(3m+1)\, dm$

$u = 3m+1$

$du = 3dm$

$dm = \frac{du}{3}$

$\int 4\sec^2 u \frac{du}{3}$

$\frac{4}{3}\int \sec^2 u\, du$

Integration of $\sec^2 u$

$= \tan u + C$

$\frac{4}{3}\int \tan u \, du$

$\frac{4}{3}\tan u + C$

$\frac{4}{3}\tan(3m+1) + C$ //