respect to

$$\frac{dt}{du} = \frac{u}{3}\left(\frac{u^2+1}{3}\right)^{-\frac{1}{2}}$$

$$dt = \frac{u\,du}{3}\left(\frac{u^2+1}{3}\right)^{-\frac{1}{2}}$$

$$2\int\left(\frac{u^2+1}{3}\right)^{\frac{1}{2}} \cdot u \cdot u\,du \left(\frac{u^2+1}{3}\right)^{-\frac{1}{2}}$$

$$\frac{2}{3}\int\left(\frac{u^2+1}{3}\right)^{\frac{1}{2}-\frac{1}{2}} \cdot u^2\,du$$

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

$$\frac{2}{3}\left[\frac{u^3}{3}\right]+c$$

$$\int 2t(3t^2-1)^{\frac{1}{2}}\,dt = \frac{2(3t^2-1)^{3/2}}{3} + c$$

c

<u>Question 3</u>

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

$$2\int\frac{x}{\sqrt{4x^2-1}}\,dx$$

$$u = \sqrt{4x^2-1}$$

$$u^2+1 = 4x^2$$

$$u = \left(\frac{u^2+1}{4}\right)^{\frac{1}{2}}$$

$$\frac{dx}{du} = \frac{1}{2}\left(\frac{u^2+1}{4}\right)^{-1/2} \cdot \frac{u}{2}$$

$$du = \frac{u\,du}{4}\left(\frac{u^2+1}{4}\right)^{-\frac{1}{2}}$$