21. $\int_0^2 \frac{x}{\sqrt{3+4x^2}}\,dx$

$u = 3+4x^2 \quad du = 8x\,dx$

$= \frac{1}{8}\int_0^2 \frac{8x}{\sqrt{3+4x^2}}\,dx$

$= \frac{1}{8}\int_{x=0}^{x=2} \frac{1}{\sqrt{u}}\,du$

$= \frac{1}{8}\int_{x=0}^{x=2} \frac{1}{u^{\frac{1}{2}}}\,du$

$= \frac{1}{8}\int_{x=0}^{x=2} u^{-\frac{1}{2}}\,du$

$= \frac{1}{8}\left[\frac{u^{-\frac{1}{2}+1}}{-\frac{1}{2}+1}\right]_{x=0}^{x=2}$

$= \frac{1}{8}\left[\frac{u^{\frac{1}{2}}}{\frac{1}{2}}\right]_{x=0}^{x=2}$

$= \frac{1}{8}\cdot\frac{2}{1}\left[\sqrt{u}\right]_{x=0}^{x=2}$

$= \frac{1}{4}\left[\sqrt{3+4x^2}\right]_{x=0}^{x=2}$

$= \frac{1}{4}\left[\sqrt{3+4(2)^2} - \sqrt{3+4(0)^2}\right]$

$= \frac{1}{4}\left(\sqrt{19}-\sqrt{3}\right)$

$x=0$	$x=2$
$u = 3+4x^2$	$u = 3+4x^2$
$u = 3+4(0)^2$	$u = 3+4(2)^2$
$u = 3$	$u = 19$

$\frac{1}{8}\int_{u=3}^{u=19} \frac{1}{\sqrt{u}}\,du$