Sec 8.3 Trigonometric Substitutions

Integrals involving, $\sqrt{n^2 + x^2}$, $\sqrt{x^2 - n^2}$ Ex $\sqrt{\frac{3}{x^2 + 9}}$ $\sqrt{x^2 + 9}$ $\sqrt{x^2 + 9}$ x = 3 + 2n0= (35e2°0d0-3√t2~0+1 dx=35ec2000 Seco== 1 = 1/2+9//3 $= \left(\frac{\sec \theta \left(\sec \theta + \tan \theta \right) d\theta}{\sec \theta + \tan \theta} \right)$ u= seco+ tono

Math
$$104$$

u = secontono du=tecotand useclo) do

= lm |n | + G

-ln/sec0+ton0+G

 $= \ln \left| \frac{\sqrt{x^2 + 9}}{7} + \frac{x}{3} \right| + 6$

 $\frac{1}{\sqrt{1-x^2}} = \frac{1-(\frac{x}{2})}{\sqrt{1-x^2}}$ $\frac{1}{\sqrt{1-x^2}} = \frac{1-(\frac{x}{2})}{\sqrt{1-x^2}}$ = \(\frac{45\in^2\text{\text{0.2600}} d\text{\text{\text{0.2600}}}{\text{4-45\in^2\text{\text{0.2600}}} = \(\frac{45\in^2\text{\text{0.2600}}}{2000} = \(\frac{45\in^2\text{0.2600}}{2000} = \(\frac{45\in^2\text{0.260

$$\begin{array}{l}
\cos(20) = \cos(0+0) \\
= \cos^2 0 - \sin^2 0 \\
= 1 - \sin^2 0 - \sin^2 0 \\
\cos(20) = 1 - 2\sin^2 0 \\
\sin^2 0 = \frac{1 - \cos(20)}{2}
\end{array}$$

$$\begin{array}{l}
\sin^2 0 = \frac{1 - \cos(20)}{2}
\end{array}$$

$$=2(\theta-\frac{1}{2}\frac{5/\sqrt{2}\theta}{2})+G$$

$$=2(\theta-\frac{1}{2}\frac{5/\sqrt{2}\theta}{2})+G$$

$$=\frac{\sqrt{4-x^{2}}}{2}$$

$$=2\sin\theta \cos\theta$$

$$= 2(5i\pi^{1}|\frac{x}{2}) - \frac{1}{2} \cdot \frac{x}{2}\sqrt{4-x^{2}} + G$$

$$= 25i\pi^{1}(\frac{x}{2}) + \frac{x}{2}\sqrt{4-x^{2}} + G$$

$$= 25i\pi^{1$$

 $x = \sqrt{3} \sec \theta$ $J_{x} = \sqrt{3} \sec \theta + \sin \theta d\theta$ $I + \tan^{2} \theta = \sec^{2} \theta$ $+ \sin^{2} \theta = \sec^{2} \theta - 1$

= (313 Sec & tomo So tomo =317 Sec 050000 =313 ((H+bm2) cee28 dd U= Sud du = secro do =313 (1+42) du

= 5^{1/2} < 51 mg = 51/6 $=\int \frac{\cos^2\theta \sqrt{d\theta}}{\sin\theta} = \int \frac{1-5/m^2\theta}{5/m^2} \sqrt{d\theta}$ = S(4500) do 416 Usind = (cscddo-55/nddo $=\int (500.1) \frac{(500-00+0)}{(500-60+0)} d0 + 6000$

 $M = CCC \theta - \cot \theta$ dn = (cs20 - cscocsdo)do $=\int_{-\pi}^{\pi} \frac{dy}{dx} + \left(\cos\theta\right) \frac{\pi \lambda}{\pi/L}$ = lu/u/ + coso/=/6 -h/csc2-co+d/xh - 650/x/2

$$\int \frac{x}{\sqrt{1b-x^4}}$$

$$U=X^{1}$$

$$u = Sind$$

$$Lu = Lord Ad$$