

SPECIAL SUBSTITUTIONS

1) For $\sqrt{1-x^2}$, use $x = \sin u$, $dx = \cos u \, du$. This implies:

- $\cos u = \sqrt{1-x^2}$
- $\sec u = \frac{1}{\sqrt{1-x^2}}$
- $\tan u = \frac{x}{\sqrt{1-x^2}}$

2) For $\sqrt{1+x^2}$, use $x = \tan u$, $dx = \sec^2 u \, du$. This also implies:

- $\sec u = \sqrt{1+x^2}$
- $\cos u = \frac{1}{\sqrt{1+x^2}}$
- $\sin u = \frac{x}{\sqrt{1+x^2}}$

3) For $\sqrt{x^2-1}$, use $x = \sec u$, $dx = \sec u \tan u \, du$. This also implies:

- $\cos u = \frac{1}{x}$
- $\sin u = \frac{\sqrt{x^2-1}}{x}$
- $\tan u = \sqrt{x^2-1}$