Section 7.4 <u>Trigonometric Substitutions</u>

Table for Trigonometric Substitution			
Expression in the integrand	Substitution	Restriction on θ	Simplification
1. $\sqrt{a^2 - x^2}$	$x = a\sin(\theta)$	$-\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$	$a^2 - x^2 = a^2 \cos^2(\theta)$
2. $\sqrt{a^2 + x^2}$	$x = a\tan(\theta)$	$-\frac{\pi}{2} < \theta < \frac{\pi}{2}$	$a^2 + x^2 = a^2 \sec^2(\theta)$
3. $\sqrt{x^2 - a^2}$	$x = a\sec(\theta)$	$0 \leq \theta < \frac{\pi}{2}$ (if $x \geq a$) $\frac{\pi}{2} < \theta \leq \pi$ (if $x \leq -a$)	$x^2 - a^2 = a^2 \tan^2(\theta)$