Lone Cases

Case Name	Step 1 - Exponent Manipulation	Step 2 - Trigonometric Identities	Step 3	Step 4
Sine-Odd	Manipulate to $\sin(x)(\sin^2(x))^p$	Sine Pythagorean Id.	Let u=cos(x)	
Sine-Even	Manipulate to $(\sin^2(x))^p$	Sine Power-Reducing Id.	Expand and apply integral linearity	Solve cosine cases
Cosine-Odd	Manipulate to $\cos(x)(\cos^2(x))^p$	Cosine Pythagorean Id.	Let u=sin(x)	
Cosine-Even	Manipulate to $(\cos^2(x))^p$	Cosine Power-Reducing Id.	Expand and apply integral linearity	Solve cosine cases
Tangent-Odd	Manipulate to $\tan(x)(\tan^2(x))^p$	Tangent Pythagorean Id.	Expand and apply integral linearity	Solve other cases
Tangent-Even	Manipulate to $(\tan^2(x))^p$	Tangent Pythagorean Id.	Expand and apply integral linearity	Solve secant cases
Cosecant-Odd	Manipulate to $\csc(x)(\csc^2(x))^p$	Cosecant Pythagorean Id.	Expand and apply integral linearity	Solve other cases
Cosecant-Even	Manipulate to $\csc^2(x)(\csc^2(x))^p$	Cosecant Pythagorean Id.	Let u=cot(x)	
Secant-Odd	Manipulate to $\sec(x)(\sec^2(x))^p$	Secant Pythagorean Id.	Expand and apply integral linearity	Solve other cases
Secant-Even	Manipulate to $\sec^2(x)(\sec^2(x))^p$	Secant Pythagorean Id.	Let u=tan(x)	
Cotangent-Odd	Manipulate to $\cot(x)(\cot^2(x))^p$	Cotangent Pythagorean Id.	Expand and apply integral linearity	Solve other cases
Cotangent-Even	Manipulate to $(\cot^2(x))^p$	Cotangent Pythagorean Id.	Expand and apply integral linearity	Solve cosecant cases

$p \in \mathbb{N}_1 = \{1,2,3,4,5,...\}$

Pair Cases

Case Name	Step 1 - Exponent Manipulation	Step 2	Step 3	Step 4
Sine-Odd and Cosine-Even	Manipulate sine powers to $\sin(x)(\sin^2(x))^p$	Sine Pythagorean Id.	Let u=cos(x)	
Sine-Even and Cosine-Odd	Manipulate sine powers to $\cos(x)(\cos^2(x))^p$	Cosine Pythagorean Id.	Let u=sin(x)	
Sine-Odd and Cosine-Odd	*Either two previous cases work*			
Sine-Even and Cosine-Even	Manipulate sine powers to $(\sin^2(x))^p$	Sine Pythagorean Id.	Expand and apply integral linearity	Solve cosine cases
Sine-Cosine Same	Manipulate powers to $(\sin(x)\cos(x))^p$	Sine Double-Angle Id.	Solve sine cases	
Secant-Odd and Tangent-Even	Manipulate tangent powers to $(\tan^2(x))^p$	Tangent Pythagorean Id.	Expand and apply integral linearity	Solve secant cases

Pair Cases (cont)

Secant-Even and Tangent-Odd	Manipulate powers to $\sec(x)\tan(x)\sec^p(x)\tan^q(x)$	Manipulate tangent powers to $(\tan^2(x))^r$	Tangent Pythagorean Id.	Let u=sec(x)
Secant-Odd and Tangent-Odd	*Same as previous case*			
Secant-Even and Tangent-Even	Manipulate secant powers to $\sec^2(x)(\sec^2(x))^p$	Secant Pythagorean Id.	Let u=tan(x)	
Secant-Tangent Same	*Same as previous two cases*			
Cosecant-Odd and Cotangent-Even	Manipulate cotangent powers to $(\cot^2(x))^p$	Cotangent Pythagorean Id.	Expand and apply integral linearity	Solve cosecant cases
Cosecant-Even and Cotangent-Odd	Manipulate powers to $\csc(x)\cot(x)\csc^p(x)\cot^q(x)$	Manipulate cotangent powers to $(\cot^2(x))^r$	Cotangent Pythagorean Id.	Let u=csc(x)
Cosecant-Odd and Cotangent-Odd	*Same as previous case*			
Cosecant-Even and Cotangent-Even	Manipulate cosecant powers to $\csc^2(x)(\csc^2(x))^p$	Cosecant Pythagorean Id.	Let u=cot(x)	
Cosecant-Cotangent Same	*Same as previous two cases*			

$p, q, r \in \mathbb{N}_1 = \{1,2,3,4,5,...\}$

Pythagorean Identities

Sine Pythagorean	$\sin^2(x)=1-\cos^2(x)$
Cosine Pythagorean	$\cos^2(x)=1-\sin^2(x)$
Tangent Pythagorean	$\tan^2(x)=\sec^2(x)-1$
Cosecant Pythagorean	$\csc^2(x)=\cot^2(x)+1$
Secant Pythagorean	$\sec^2(x)=\tan^2(x)+1$
Cotangent Pythagorean	$\cot^2(x)=\csc^2(x)-1$
Sine-Cosine Pythagorean	$1=\sin^2(x)+\cos^2(x)$
Secant-Tangent Pythagorean	$1=\sec^2(x)-\tan^2(x)$
Cosecant-Cotangent Pythagorean	$1=\csc^2(x)-\cot^2(x)$

Reduction Formulas

$\int\sin^n(x)dx$, $n\geq 2$	$-\cos(x)\sin^{n-1}(x)/n + (n-1/n)\int\sin^{n-2}(x)dx$
$\int\cos^n(x)dx$, $n\geq 2$	$\cos(x)^{n-1}\sin(x)/n + (n-1/n)\int\cos^{n-2}(x)dx$
$\int\tan^n(x)dx$, $n\geq 2$	$\tan^{n-1}(x)/(n-1) - \int\tan^{n-2}(x)dx$
$\int\csc^n(x)dx$, $n\geq 2$	$-\csc^{n-2}(x)\cot(x)/(n-1) + ((n-2)/(n-1))\int\csc^{n-2}(x)dx$
$\int\sec^n(x)dx$, $n\geq 2$	$\sec^{n-2}(x)\tan(x)/(n-1) + ((n-2)/(n-1))\int\sec^{n-2}(x)dx$
$\int\cot^n(x)dx$, $n\geq 2$	$-\cot^{n-1}(x)/(n-1) - \int\cot^{n-2}(x)dx$

$n \in \mathbb{N}_1 = \{1,2,3,4,5,...\}$

Miscellaneous Information

Binomial Expansion	$(a+b)^n = \sum^n_{k=0} (^n{}_k)\, a^{n-k}b^k$
Integral Linearity Property: Sum and Difference	$\int(f(x) \pm g(x))dx = \int f(x)dx \pm \int g(x)dx$
$\int\tan(x)dx$	$\ln\lvert\sec(x)\rvert+C$
$\int\cot(x)dx$	$\ln\lvert\sin(x)\rvert+C$
$\int\sec(x)dx$	$\ln\lvert\sec(x)+\tan(x)\rvert+C$
$\int\sec^3(x)dx$	$½(\sec(x)\tan(x)+\ln\lvert\sec(x)+\tan(x)\rvert)+C$
$\int\csc(x)dx$	$\ln\lvert\csc(x)-\cot(x)\rvert+C$
$\int\csc^3(x)dx$	$-½(\csc(x)\cot(x)+\ln\lvert\csc(x)+\cot(x)\rvert)+C$

$(^n{}_k)$ are the binomial coefficients, equal to $n!/(k!(n-k)!)$

$n, k \in \mathbb{N}_1 = \{1,2,3,4,5,...\}$