Evaluating the Integral $\int \sin^m x \cdot \cos^n x \, dx$

Power of sin x

Power of cos x	negative, even	negative, odd	nonnegative, even	positive, odd
positive, odd	←	←	$\cos^2 x = 1-\sin^2 x$ u = sin x du = cos x	← OR ↓
nonnegative, even	If n ≥ -m, let $\cos^2 x = 1-\sin^2 x$ If -m > n $\csc^2 x = 1+\cot^2 x$ u = cot x $du = -\csc^2 x$	If -m > n $\cot^2 x = \csc^2 x - 1$ Integration by Parts $dv = \csc^2 x$	Power-reducing $\sin^2 x = (1-\cos 2x)/2$ $\cos^2 x = (1+\cos 2x)/2$	$\sin^2 x = 1-\cos^2 x$ u = cos x du = -sin x
negative, odd	multiply by $\cos^2 x+\sin^2 x$ break fraction, cancel functions		If -n > m $\tan^2 x = \sec^2 x - 1$ Integration by Parts $dv = \sec^2 x$	↓
negative, even			If m ≥ -n, let $\sin^2 x = 1-\cos^2 x$ If -n > m $\sec^2 x = 1+\tan^2 x$ u = tan x $du = \sec^2 x$	↓