Show that $\cos^3 x\ \sin^4 x$ may be converted to the expression $(1-\sin^2 x)\sin^4 x\ \cos x$

$$\cos^3 x\ \sin^4 x = \cos x\ \cos^2 x\ \sin^4 x$$

$$\cos x\ (1-\sin^2 x)\ \sin^4 x$$

Show that the first expression is equivalent to the second:

$\dfrac{\cot^2\beta+\sec^2\beta+1}{\cot^2\beta}=\sec^4\beta$	
$\dfrac{\cot^2\beta+\tan^2\beta+1+1}{\cot^2\beta}$	Apply the Pythagorean Identity: $\tan^2\theta+1=\sec^2\theta$
$\dfrac{\cot^2\beta+\tan^2\beta+2}{\cot^2\beta}$	Rewrite everything in terms of tangent.
$\dfrac{\frac{1}{\tan^2\beta}+\tan^2\beta+2}{\frac{1}{\tan^2\beta}}$ $\left(\dfrac{\frac{1}{\tan^2\beta}+\tan^2\beta+2}{\frac{1}{\tan^2\beta}}\right)\times\tan^2\beta$	When confronted w/a complex fraction, multiply all terms by the common denominator of the "mini fractions."
$\dfrac{1+\tan^4\beta+2\tan^2\beta}{1}$	Factor the numerator. Pretend it's: $x^4+2x^2+1=(x^2+1)(x^2+1)$
$(\tan^2\beta+1)(\tan^2\beta+1)$	Apply the Pythagorean Identity: $\tan^2\theta+1=\sec^2\theta$
$(\sec^2\beta)(\sec^2\beta)$	
$\sec^4\beta$	