Write the following expression in terms of sine.

$\dfrac{1}{1+\cot\theta}+\dfrac{1}{1-\cot\theta}$	
$(1+\cot\theta)(1-\cot\theta)$	Find a common denominator
$\dfrac{1(1-\cot\theta)}{(1+\cot\theta)(1-\cot\theta)}+\dfrac{1(1+\cot\theta)}{(1-\cot\theta)(1+\cot\theta)}$	Write each expression as an equivalent expression w/this common denominator.
$\dfrac{1-\cot\theta+1+\cot\theta}{(1+\cot\theta)(1-\cot\theta)}$	Add the numerators; write the sum over the common denominator.
$\dfrac{2}{1-\cot^2\theta}$	Simplify.
$\dfrac{2}{1-\cot^2\theta}=\dfrac{2}{1-(\csc^2\theta-1)}$ $=\dfrac{2}{1-\csc^2\theta+1}=\dfrac{2}{2-\csc^2\theta}$	Apply a Pythagorean Identity: $1+\cot^2\theta=\csc^2\theta$ Solve this for cotangent: $\cot^2\theta=\csc^2\theta-1$ Substitute & simplify.
$\dfrac{2}{2-\csc^2\theta}=\dfrac{2}{2-\dfrac{1}{\sin^2\theta}}$	We know that: $\csc\theta=\dfrac{1}{\sin\theta}$
$\dfrac{2\times\sin^2\theta}{2\times\sin^2\theta-\dfrac{1}{\sin^2\theta}\times\sin^2\theta}$	Multiply all 3 terms by $\sin^2\theta$
$\dfrac{2\sin^2\theta}{2\sin^2\theta-1}$	

Write the following expression in terms of cosine.

$\sin^4\alpha - 2\sin^2\alpha + 1$	
$(\sin^2\alpha - 1)(\sin^2\alpha - 1)$	Factor. (Think in terms of x.) $x^4 - 2x^2 + 1 = (x^2 - 1)(x^2 - 1)$
$(1 - \cos^2\alpha - 1)(1 - \cos^2\alpha - 1)$ $(-\cos^2\alpha)(-\cos^2\alpha)$ $\cos^4\alpha$	Apply a Pythagorean Identity: $\sin^2\theta + \cos^2\theta = 1$ Solve for sine: $\sin^2\theta = 1 - \cos^2\theta$ Substitute & simplify.

Write the following expression in terms of tangent.

$\frac{\sec\theta}{\sin\theta}$	
$\frac{\sec\theta}{\sin\theta} \times \frac{\sec\theta}{\sec\theta} = \frac{\sec^2\theta}{\sin\theta\sec\theta}$	Multiply the numerator and denominator by $\sec\theta$ (we're technically multiplying by 1)
$\frac{\sec^2\theta}{\sin\theta\sec\theta} = \frac{\tan^2\theta + 1}{\sin\theta \times \frac{1}{\cos\theta}} = \frac{\tan^2\theta + 1}{\frac{\sin\theta}{\cos\theta}}$	Apply a Pythagorean Identity: $\tan^2\theta + 1 = \sec^2\theta$ Rewrite $\sec\theta$ in terms of $\cos\theta$ Substitute & simplify.
$\frac{\tan^2\theta + 1}{\tan\theta}$	$\frac{\sin\theta}{\cos\theta} = \tan\theta$ Substitute.