#19. $1+\sin\theta = \dfrac{\cos^2\theta}{1-\sin\theta}$

$= \dfrac{1-\sin^2\theta}{1-\sin\theta}$

$= \dfrac{(1+\sin\theta)(1-\sin\theta)}{1-\sin\theta}$

#25. $\sec^4\theta - \tan^4\theta = \dfrac{1+\sin^2\theta}{\cos^2\theta}$

$\tan^2+1=\sec^2$

$1=\sec^2-\tan^2$

$(\sec^2\theta+\tan^2\theta)(\sec^2\theta-\tan^2\theta)$

1

$\sec^2\theta+\tan^2\theta$

$\dfrac{1}{\cos^2\theta} + \dfrac{\sin^2\theta}{\cos^2\theta}$

$\dfrac{1+\sin^2\theta}{\cos^2\theta}$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$27x^3 - 8y^6 = (3x - 2y^2)(9x^2 + 6xy^2 + 4y^4)$$

#29. $\csc B - \sin B = \cot B \cdot \cos B$

$\frac{1}{\sin B} - \sin B$

$\frac{1 - \sin^2 B}{\sin B}$

$\frac{\cos^2 B}{\sin B}$

$\frac{\cos B \cdot \cos B}{\sin B}$

$\cot B \cdot \cos B$

$\sin^2 + \cos^2 = 1$

$\sin^2 = 1 - \cos^2$

$-\sin^2 = \cos^2 - 1$

#54. $\dfrac{\cot^2 B - \cos^2 B}{\csc^2 B - 1} = \cos^2 B$

$\cot^2 + 1 = \csc^2$

$\cot^2 = \dfrac{\cos^2}{\sin^2}$

$\dfrac{\cot^2 B - \cos^2 B}{\cot^2 B}$

$\dfrac{\cot^2 B}{\cot^2 B} - \dfrac{\cos^2 B}{\cot^2 B}$

$1 - \dfrac{\cos^2 B}{\frac{\cos^2 B}{\sin^2 B}}$

$1 - \sin^2 B$

$\cos^2 B = \cos^2 B$

#60. $\dfrac{1+\cot^3 t}{1+\cot t} = \csc^2 t - \cot t$

$$\frac{(1+\cot t)(1-\cot t+\cot^2 t)}{1+\cot t}$$

$$1-\cot t+\cot^2 t$$

$$-\cot t+1+\cot^2 t$$

$$\csc^2 t - \cot t = \csc^2 t - \cot t$$

#62. $\dfrac{\cot^2 x}{\sin x + \cos x} = \dfrac{\cos^2 x \cdot \sin x - \cos^3 x}{2\sin^4 x - \sin^2 x}$

$= \dfrac{\cos^2 x}{\sin^2 x} \cdot \dfrac{(\sin x - \cos x)}{(2\sin^2 x - 1)}$

$= \cot^2 x \dfrac{(\sin x - \cos x)}{(2\sin^2 x - 1)}$

$= \cot^2 x \dfrac{(\sin x - \cos x)}{(\sin x + \cos x)(\sin x - \cos x)}$

$= \dfrac{\cot^2 x}{\sin x + \cos x}$

$2\sin^2 x - 1$

$\sin^2 x + \sin^2 x - 1$

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

$\sin^2 x - \cos^2 x$ *