PW #2

① $\tan\alpha\cos\alpha = \left(\frac{\sin\alpha}{\cos\alpha}\right)\left(\frac{\cos\alpha}{1}\right) = \boxed{\sin\alpha}$

② $\frac{\tan\theta}{\sin\theta} = \frac{\frac{\sin\theta}{\cos\theta}}{\sin\theta} = \frac{\sin\theta}{\cos\theta}\cdot\frac{1}{\sin\theta} = \frac{1}{\cos\theta} = \boxed{\sec\theta}$

③ $1+\cot^2\theta = \boxed{\csc^2\theta}$

④ $\frac{\tan\theta\cos\theta}{\sin\theta} = \frac{\left(\frac{\sin\theta}{\cos\theta}\right)\left(\frac{\cos\theta}{1}\right)}{\frac{\sin\theta}{1}} = \frac{\sin\theta}{\sin\theta} = \boxed{1}$

⑤ $\sec^2\theta - 1 = \boxed{\tan^2\theta}$

⑥ $(\sin\theta+\cos\theta)^2 = (\sin\theta+\cos\theta)(\sin\theta+\cos\theta) =$

$\sin^2\theta+\sin\theta\cos\theta+\cos\theta\sin\theta+\cos^2\theta = \boxed{1+2\sin\theta\cos\theta}$

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

⑦ $\frac{\tan^2\theta}{\sin^2\theta} = \frac{\frac{\sin^2\theta}{\cos^2\theta}}{\sin^2\theta} = \frac{\sin^2\theta}{\cos^2\theta}\cdot\frac{1}{\sin^2\theta} = \frac{1}{\cos^2\theta} = \boxed{\sec^2\theta}$

⑧ $\frac{\tan^2\theta}{1-\sec^2\theta} = \frac{\tan^2\theta}{-\tan^2\theta} = \boxed{-1}$

⑨ $\frac{\cot\theta}{\cos\theta} = \frac{\frac{\cos\theta}{\sin\theta}}{\cos\theta} = \frac{\cos\theta}{\sin\theta}\cdot\frac{1}{\cos\theta} = \frac{1}{\sin\theta} = \boxed{\csc\theta}$

PW #2

(10) $\sin\theta \csc\theta = \left(\frac{\sin\theta}{1}\right)\left(\frac{1}{\sin\theta}\right) = \boxed{1}$

(11) $\tan\alpha \cot\alpha = \left(\frac{\sin\alpha}{\cos\alpha}\right)\left(\frac{\cos\alpha}{\sin\alpha}\right) = \boxed{1}$

(12) $\frac{\tan^2\alpha}{\sec^2\alpha} = \frac{\frac{\sin^2\alpha}{\cos^2\alpha}}{\frac{1}{\cos^2\alpha}} = \frac{\sin^2\alpha}{\cos^2\alpha} \cdot \frac{\cos^2\alpha}{1} = \boxed{\sin^2\alpha}$

(13) $\frac{(\sin^2\theta)}{(1-\cos\theta)} \cdot \frac{(1+\cos\theta)}{(1+\cos\theta)}$ [* Why can you do this?] $\frac{\sin^2\theta(1+\cos\theta)}{(1-\cos^2\theta)}$

FOIL

$= \frac{(1-\cos^2\theta)(1+\cos\theta)}{(1-\cos^2\theta)} = \boxed{1+\cos\theta}$

(14) $\cos\theta \csc\theta \tan\theta = \left(\frac{\cos\theta}{1}\right)\left(\frac{1}{\sin\theta}\right)\left(\frac{\sin\theta}{\cos\theta}\right) = \boxed{1}$

(15) $\frac{1-\cos^2\alpha}{\sin\alpha\cos\alpha} = \frac{\sin^2\alpha}{\sin\alpha\cos\alpha} = \frac{\sin\alpha}{\sin\alpha} \cdot \frac{\sin\alpha}{\cos\alpha} = 1 \cdot \tan\alpha = \boxed{\tan\alpha}$