Trig Indentities Test Corrections

5) $\sin 5A + \sin 2A - \sin A = \sin 2A(2\cos 3A + 1)$

$LS = \sin 2A + \sin 5A - \sin A$
$= \sin 2A + \sin(3A + 2A) - \sin(3A - 2A)$
$= \sin 2A + 2\cos 3A \sin 2A$
$= \sin 2A(1 + 2\cos 3A)$

$RS = \sin 2A(1 + 2\cos 3A)$

$\therefore LS = RS$
$\therefore \sin 5A + \sin 2A - \sin A = \sin 2A(2\cos 3A + 1)$

4) $\cot 2A + \tan A = \csc 2A$

$LS = \cot 2A + \tan A$

$= \dfrac{1}{\tan 2A} + \tan A$

$= \dfrac{1 - \tan^2 A}{2\tan A} + \tan A \quad \times \dfrac{2\tan A}{2\tan A}$

$= \dfrac{1 - \tan^2 A + 2\tan^2 A}{2\tan A}$

$= \dfrac{1 + \tan^2 A}{2\tan A}$

$= \dfrac{\sec^2 A}{2\tan A}$

$= \dfrac{\sec^2 A}{2} \times \dfrac{\cos A}{\sin A}$

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

$= \dfrac{1}{2\cos A \sin A}$

$= \dfrac{1}{\sin 2A}$

$= \csc 2A$

$RS = \csc 2A$

$\therefore LS = RS$
$\therefore \cot 2A + \tan A = \csc 2A$