

(52 - cont.)

$$\begin{aligned}
 & \frac{\operatorname{tg} x (1 - \operatorname{tg} y \operatorname{tg} z) + \operatorname{tg} y + \operatorname{tg} z}{1 - \operatorname{tg} y \operatorname{tg} z} \\
 = & \frac{1 - \operatorname{tg} y \operatorname{tg} z - \operatorname{tg} x (\operatorname{tg} y + \operatorname{tg} z)}{1 - \operatorname{tg} y \operatorname{tg} z} \\
 = & \frac{\operatorname{tg} x - \operatorname{tg} x \operatorname{tg} y \operatorname{tg} z + \operatorname{tg} y + \operatorname{tg} z}{1 - \operatorname{tg} y \operatorname{tg} z - \operatorname{tg} x \operatorname{tg} y - \operatorname{tg} x \operatorname{tg} z} \\
 \equiv & \frac{\operatorname{tg} x + \operatorname{tg} y + \operatorname{tg} z - \operatorname{tg} x \operatorname{tg} y \operatorname{tg} z}{1 - \operatorname{tg} x \operatorname{tg} y - \operatorname{tg} x \operatorname{tg} z - \operatorname{tg} y \operatorname{tg} z} //
 \end{aligned}$$

$$53) \csc^2\left(\frac{\pi}{2} - x\right) = 1 + \sin^2 x \csc^2\left(\frac{\pi}{2} - x\right)$$

$$\begin{aligned}
 \rightarrow & \left\{ \begin{aligned}
 & 1 + \sin^2 x \csc^2\left(\frac{\pi}{2} - x\right) = \\
 & = 1 + \frac{\sin^2 x}{\sin^2\left(\frac{\pi}{2} - x\right)} = 1 + \frac{\sin^2 x}{(\sin\left(\frac{\pi}{2} - x\right))^2} \\
 & = 1 + \frac{\sin^2 x}{\cos^2 x} = 1 + \operatorname{tg}^2 x = \boxed{\sec^2 x}
 \end{aligned} \right.
 \end{aligned}$$

$$\left\{ \csc^2\left(\frac{\pi}{2} - x\right) = \frac{1}{\sin^2\left(\frac{\pi}{2} - x\right)} = \frac{1}{\cos^2 x} = \boxed{\sec^2 x} \right.$$

$$// \csc^2\left(\frac{\pi}{2} - x\right) = 1 + \sin^2 x \csc^2\left(\frac{\pi}{2} - x\right) //$$