51) $tg\left(\frac{\pi}{2}-x\right) - ctg\left(\frac{3\pi}{2}-x\right) + tg(2\pi-x) - ctg(\pi-x) = \frac{4-2\sec^2 x}{tg\,x}$

$\rightarrow tg\left(\frac{\pi}{2}-x\right) - ctg\left(\frac{3\pi}{2}-x\right) + tg(2\pi-x) - ctg(\pi-x) =$

$= ctg\,x - tg\,x - tg\,x - (-ctg\,x)$

$= 2ctg\,x - 2tg\,x$

$= 2\left(\frac{1}{tg\,x} - tg\,x\right) = 2\left(\frac{1-tg^2 x}{tg\,x}\right)$

$1+tg^2x = \sec^2 x \Leftrightarrow tg^2x = \sec^2 x - 1$

$= \frac{2(1-(\sec^2 x-1))}{tg\,x} = \frac{2(2-\sec^2 x)}{tg\,x}$

$= \frac{4-2\sec^2 x}{tg\,x}$ //

---

52) $tg(x+y+z) = \frac{tg\,x + tg\,y + tg\,z - tg\,x\,tg\,y\,tg\,z}{1 - tg\,x\,tg\,y - tg\,x\,tg\,z - tg\,y\,tg\,z}$

$\rightarrow tg(x+y+z) = tg(x+(y+z))$

$= \frac{tg\,x + tg(y+z)}{1 - tg\,x \cdot tg(y+z)}$

$= \frac{tg\,x + \frac{tg\,y + tg\,z}{1 - tg\,y\,tg\,z}}{1 - tg\,x \cdot \left(\frac{tg\,y + tg\,z}{1 - tg\,y \cdot tg\,z}\right)}$