45. $\dfrac{\sec\alpha - \operatorname{cosec}\alpha}{\sec\alpha \cdot \operatorname{cosec}\alpha} = \operatorname{sen}\alpha - \cos\alpha$

$$\frac{\sec\alpha - \operatorname{cosec}\alpha}{\sec\alpha \cdot \operatorname{cosec}\alpha} = \frac{\frac{1}{\cos\alpha} - \frac{1}{\operatorname{sen}\alpha}}{\frac{1}{\cos\alpha} \cdot \frac{1}{\operatorname{sen}\alpha}} = \frac{\frac{\operatorname{sen}\alpha - \cos\alpha}{\operatorname{sen}\alpha\cos\alpha}}{\frac{1}{\operatorname{sen}\alpha\cos\alpha}} =$$

$$= \operatorname{sen}\alpha - \cos\alpha$$

46. $\dfrac{\operatorname{sen}^2\alpha - \operatorname{tg}\alpha}{\cos^2\alpha - \operatorname{cotg}\alpha} = \operatorname{tg}^2\alpha$

$$\frac{\operatorname{sen}^2\alpha - \operatorname{tg}\alpha}{\cos^2\alpha - \operatorname{cotg}\alpha} = \frac{\operatorname{sen}^2\alpha - \frac{\operatorname{sen}\alpha}{\cos\alpha}}{\cos^2\alpha - \frac{\cos\alpha}{\operatorname{sen}\alpha}} = \frac{\frac{\operatorname{sen}^2\alpha\cos\alpha - \operatorname{sen}\alpha}{\cos\alpha}}{\frac{\cos^2\alpha\operatorname{sen}\alpha - \cos\alpha}{\operatorname{sen}\alpha}} =$$

$$= \frac{\operatorname{sen}\alpha(\operatorname{sen}^2\alpha\cos\alpha - \operatorname{sen}\alpha)}{\cos\alpha(\cos^2\alpha\operatorname{sen}\alpha - \cos\alpha)} = \frac{\operatorname{sen}^2\alpha(\operatorname{sen}\alpha\cos\alpha - 1)}{\cos^2\alpha(\operatorname{sen}\alpha\cos\alpha - 1)} =$$

$$= \frac{\operatorname{sen}^2\alpha}{\cos^2\alpha} = \operatorname{tg}^2\alpha$$

47. $\sec\alpha - \cos\alpha = \operatorname{sen}\alpha \cdot \operatorname{tg}\alpha$

$$\sec\alpha - \cos\alpha = \frac{1}{\cos\alpha} - \cos\alpha = \frac{1-\cos^2\alpha}{\cos\alpha} =$$

$$= \frac{\operatorname{sen}^2\alpha}{\cos\alpha} = \operatorname{sen}\alpha \cdot \frac{\operatorname{sen}\alpha}{\cos\alpha} = \operatorname{sen}\alpha \cdot \operatorname{tg}\alpha$$

48. $\operatorname{tg}\alpha + \operatorname{cotg}\alpha = \sec\alpha \operatorname{cosec}\alpha$

$$\operatorname{tg}\alpha + \operatorname{cotg}\alpha = \frac{\operatorname{sen}\alpha}{\cos\alpha} + \frac{\cos\alpha}{\operatorname{sen}\alpha} = \frac{\operatorname{sen}^2\alpha + \cos^2\alpha}{\cos\alpha\operatorname{sen}\alpha} =$$

$$= \frac{1}{\cos\alpha \cdot \operatorname{sen}\alpha} = \frac{1}{\cos\alpha} \cdot \frac{1}{\operatorname{sen}\alpha} = \sec\alpha \cdot \operatorname{cosec}\alpha$$

49. $\dfrac{1}{1-\operatorname{sen}\alpha} + \dfrac{1}{1+\operatorname{sen}\alpha} = 2\sec^2\alpha$

$$\frac{1}{1-\operatorname{sen}\alpha} + \frac{1}{1+\operatorname{sen}\alpha} = \frac{1+\operatorname{sen}\alpha + 1 - \operatorname{sen}\alpha}{(1-\operatorname{sen}\alpha)(1+\operatorname{sen}\alpha)} = \frac{2}{1-\operatorname{sen}^2\alpha} =$$

$$= \frac{2}{\cos^2\alpha} = 2 \cdot \frac{1}{\cos^2\alpha} = 2\sec^2\alpha$$