

50.

$$\frac{\sec \alpha}{1 - \sec \alpha} = \frac{1 + \sec \alpha}{\cos^3 \alpha}$$

$$\frac{\sec \alpha}{1 - \sec \alpha} = \frac{1}{\cos \alpha} = \frac{1}{\cos \alpha (1 - \sec \alpha)} = \frac{1 + \sec \alpha}{\cos \alpha (1 - \sec \alpha) (1 + \sec \alpha)}$$

$$= \frac{1 + \sec \alpha}{\cos \alpha (1 - \sec^2 \alpha)} = \frac{1 + \sec \alpha}{\cos \alpha \cdot \cos^2 \alpha} = \frac{1 + \sec \alpha}{\cos^3 \alpha}$$

51.

$$\frac{1 + \sec \alpha}{1 - \sec \alpha} - \frac{1 - \sec \alpha}{1 + \sec \alpha} = 4 \operatorname{tg} \alpha \cdot \sec \alpha$$

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

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

$$= \frac{1 + 2 \sec \alpha + \sec^2 \alpha - 1 + 2 \sec \alpha - \sec^2 \alpha}{\cos^2 \alpha} = \frac{4 \sec \alpha}{\cos^2 \alpha} =$$

$$= 4 \frac{\sec \alpha}{\cos \alpha} \cdot \frac{1}{\cos \alpha} = 4 \operatorname{tg} \alpha \cdot \sec \alpha$$

$$52. \quad \frac{\sec^2 \alpha - \operatorname{tg}^2 \alpha + \operatorname{tg} \alpha}{\sec \alpha} = \sec \alpha + \cos \alpha$$

$$\stackrel{1 + \operatorname{tg}^2 \alpha}{=} \frac{(\sec^2 \alpha) \operatorname{tg}^2 \alpha + \operatorname{tg} \alpha}{\sec \alpha} = \frac{1 + \operatorname{tg}^2 \alpha - \operatorname{tg}^2 \alpha + \operatorname{tg} \alpha}{\sec \alpha} =$$

$$= \frac{1 + \frac{\sec \alpha}{\cos \alpha}}{\frac{1}{\cos \alpha}} = \frac{\cos \alpha + \sec \alpha}{\cos \alpha} = \frac{1}{\cos \alpha} = \sec \alpha + \cos \alpha$$