

$$\mathbf{16.17} \quad 1) \quad \tan(\alpha + \beta) = \frac{\sin(\alpha + \beta)}{\cos(\alpha + \beta)} = \frac{\sin(\alpha) \cos(\beta) + \cos(\alpha) \sin(\beta)}{\cos(\alpha) \cos(\beta) - \sin(\alpha) \sin(\beta)}$$

$$= \frac{\frac{\sin(\alpha) \cos(\beta)}{\cos(\alpha) \cos(\beta)} + \frac{\cos(\alpha) \sin(\beta)}{\cos(\alpha) \cos(\beta)}}{\frac{\cos(\alpha) \cos(\beta)}{\cos(\alpha) \cos(\beta)} - \frac{\sin(\alpha) \sin(\beta)}{\cos(\alpha) \cos(\beta)}}$$

$$= \frac{\frac{\sin(\alpha)}{\cos(\alpha)} + \frac{\sin(\beta)}{\cos(\beta)}}{1 - \frac{\sin(\alpha)}{\cos(\alpha)} \cdot \frac{\sin(\beta)}{\cos(\beta)}} = \frac{\tan(\alpha) + \tan(\beta)}{1 - \tan(\alpha) \tan(\beta)}$$

$$2) \quad \tan(\alpha - \beta) = \tan(\alpha + (-\beta)) = \frac{\tan(\alpha) + \tan(-\beta)}{1 - \tan(\alpha) \tan(-\beta)} = \frac{\tan(\alpha) - \tan(\beta)}{1 + \tan(\alpha) \tan(\beta)}$$