

TD 2 : exo 6

1)  $\mathcal{D}_{\tan} = \mathbb{R} \setminus \left\{ \frac{\pi}{2} + k\pi, k \in \mathbb{Z} \right\}$

$$\begin{aligned} 2) \tan(x+y) &= \frac{\sin(x+y)}{\cos(x+y)} = \frac{\sin(x)\cos(y) + \cos(x)\sin(y)}{\cos(x)\cos(y) - \sin(x)\sin(y)} \\ &= \frac{\cancel{\sin(x)}\cancel{\cos(y)} + \cancel{\cos(x)}\cancel{\sin(y)}}{\cancel{\cos(x)}\cancel{\cos(y)} - \cancel{\sin(x)}\cancel{\sin(y)}} \\ &= \frac{\boxed{\frac{\cos(x)\cos(y)}{\cos(x)\cos(y)}} - \frac{\sin(x)\sin(y)}{\cos(x)\cos(y)}}{=} \\ &= 1 \end{aligned}$$

$$\begin{aligned} &\frac{\sin(x)}{\cos(x)} + \frac{\sin(y)}{\cos(y)} \\ &= \frac{\boxed{1} - \frac{\sin(x)\sin(y)}{\cos(x)\cos(y)}}{=} \\ &= \frac{\tan(x) + \tan(y)}{1 - \tan(x)\tan(y)} \end{aligned}$$