

$$\begin{aligned}
C_+ \text{ characteristic line} &\rightarrow \partial(\theta - \nu) = -\frac{1}{\sqrt{M^2 - 1} + 1/\tan\theta} \frac{\partial r}{r} \\
\rightarrow \sqrt{M^2 - 1} &= 1/\tan\mu \rightarrow \frac{\partial}{\partial K_+}(\theta - \nu) = -\frac{1}{1/\tan\mu + 1/\tan\theta} \frac{dr}{r} = -\frac{\tan\mu \cdot \tan\theta}{\tan\theta + \tan\mu} \frac{\partial r}{r} = \\
&-\frac{\partial r}{\cos\mu \cdot \cos\theta \cdot \left(\frac{\sin\theta}{\cos\theta} + \frac{\sin\mu}{\cos\mu}\right)} \left(\frac{\sin\mu \cdot \sin\theta}{r}\right) = -\frac{dr}{(\sin\theta \cdot \cos\mu + \sin\mu \cdot \cos\theta)} \left(\frac{\sin\mu \cdot \sin\theta}{r}\right) = \\
&-\left[\frac{\partial r}{\sin(\theta + \mu)}\right] \left(\frac{\sin\mu \cdot \sin\theta}{r}\right) \rightarrow \partial K_+ = \left[\frac{\partial r}{\sin(\theta + \mu)}\right] \rightarrow \\
\partial(\theta - \nu) &= -\partial K_+ \left(\frac{\sin\mu \cdot \sin\theta}{r}\right) \rightarrow \boxed{\frac{\partial(\theta - \nu)}{\partial K_+} = -\left(\frac{\sin\mu \cdot \sin\theta}{r}\right)}
\end{aligned}$$

$$\begin{aligned}
\partial K_+ &= \left[\frac{\partial r}{\sin(\theta + \mu)}\right] \rightarrow dr = [\sin(\theta + \mu)] \cdot \partial K_+ \\
\frac{\partial r}{\partial x} &= \tan(\theta + \mu) \rightarrow [\sin(\theta + \mu)] \cdot \partial K_+ = \tan(\theta + \mu) \cdot dx \rightarrow \boxed{\partial K_+ = \frac{\partial x}{\cos(\theta + \mu)}}
\end{aligned}$$

$$\begin{aligned}
C_- \text{ characteristic line} &\rightarrow \partial(\theta + \nu) = \frac{1}{\sqrt{M^2 - 1} - 1/\tan\theta} \frac{\partial r}{r} \\
\rightarrow \sqrt{M^2 - 1} &= 1/\tan\mu \rightarrow \frac{\partial}{\partial K_-}(\theta + \nu) = \frac{1}{1/\tan\mu - 1/\tan\theta} \frac{dr}{r} = \frac{\tan\mu \cdot \tan\theta}{\tan\theta - \tan\mu} \frac{\partial r}{r} = \\
&\frac{\partial r}{\cos\mu \cdot \cos\theta \cdot \left(\frac{\sin\theta}{\cos\theta} - \frac{\sin\mu}{\cos\mu}\right)} \left(\frac{\sin\mu \cdot \sin\theta}{r}\right) = \frac{dr}{(\sin\theta \cdot \cos\mu - \sin\mu \cdot \cos\theta)} \left(\frac{\sin\mu \cdot \sin\theta}{r}\right) = \\
&\left[\frac{\partial r}{\sin(\theta - \mu)}\right] \left(\frac{\sin\mu \cdot \sin\theta}{r}\right) \rightarrow \partial K_+ = \left[\frac{\partial r}{\sin(\theta - \mu)}\right] \rightarrow \\
\partial(\theta + \nu) &= \partial K_+ \left(\frac{\sin\mu \cdot \sin\theta}{r}\right) \rightarrow \boxed{\frac{\partial(\theta + \nu)}{\partial K_+} = \left(\frac{\sin\mu \cdot \sin\theta}{r}\right)}
\end{aligned}$$

$$\begin{aligned}
\partial K_- &= \left[\frac{\partial r}{\sin(\theta - \mu)}\right] \rightarrow dr = [\sin(\theta - \mu)] \cdot \partial K_- \\
\frac{\partial r}{\partial x} &= \tan(\theta - \mu) \rightarrow [\sin(\theta - \mu)] \cdot \partial K_- = \tan(\theta - \mu) \cdot dx \rightarrow \boxed{\partial K_- = \frac{\partial x}{\cos(\theta - \mu)}}
\end{aligned}$$