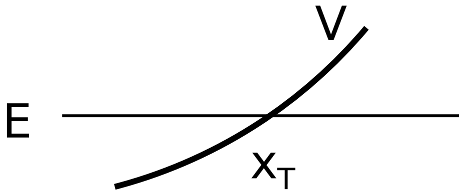
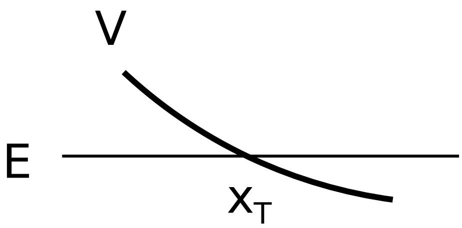
WKB connection formulae

Upward sloping potental $V'(x_T) > 0$:



$$\psi(x) = \begin{cases} \frac{2D}{\sqrt{p(x)}} \sin\left(\frac{1}{\hbar}\int_x^{x_T} dx' p(x') + \frac{\pi}{4}\right) + \frac{F}{\sqrt{p(x)}} \cos\left(\frac{1}{\hbar}\int_x^{x_T} dx' p(x') + \frac{\pi}{4}\right) & , x < x_T \\ \frac{D}{\sqrt{|p(x)|}} e^{-\frac{1}{\hbar}\int_{x_T}^{x} dx' |p(x')|} + \frac{F}{\sqrt{|p(x)|}} e^{\frac{1}{\hbar}\int_{x_T}^{x} dx' |p(x')|} & , x > x_T \end{cases}$$

Downward sloping potential $V'(x_T) < 0$:



$$\psi(x) = \begin{cases} \frac{D'}{\sqrt{|p(x)|}} e^{-\frac{1}{\hbar}\int_x^{x_T} dx' |p(x')|} + \frac{F'}{\sqrt{|p(x)|}} e^{\frac{1}{\hbar}\int_x^{x_T} dx' |p(x')|} & , x < x_T \\ \frac{2D'}{\sqrt{p(x)}} \sin\left(\frac{1}{\hbar}\int_{x_T}^{x} dx' p(x') + \frac{\pi}{4}\right) + \frac{F'}{\sqrt{p(x)}} \cos\left(\frac{1}{\hbar}\int_{x_T}^{x} dx' p(x') + \frac{\pi}{4}\right) & , x > x_T \end{cases}$$