## Answer on Question \#61021-Physics-Mechanics-Relativity

A particle $m$ is suspended by a massless string inside a trolley of mass $m$. Force $F$ is being applied on trolley to move it on friction less surface. The angle theta between the string and vertical when particle is in equilibrium with respect to trolley.

## Solution

Inside of the car speeding up on a horizontal road with acceleration ' $a$ '.

$\theta=$ constant angle with $\mathrm{T}=$ Tension in the string $\mathrm{mg}=$ ball's weight vertical by the string $m=$ mass of the ball ma=pseudo force

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\begin{aligned}
a & =\frac{F}{m+m}=\frac{F}{2 m} \\
\tan \theta & =\frac{g}{a}=\frac{g}{\frac{F}{2 m}}=\frac{2 m g}{F} \\
\theta & =\tan ^{-1}\left(\frac{2 m g}{F}\right) .
\end{aligned}
$$

