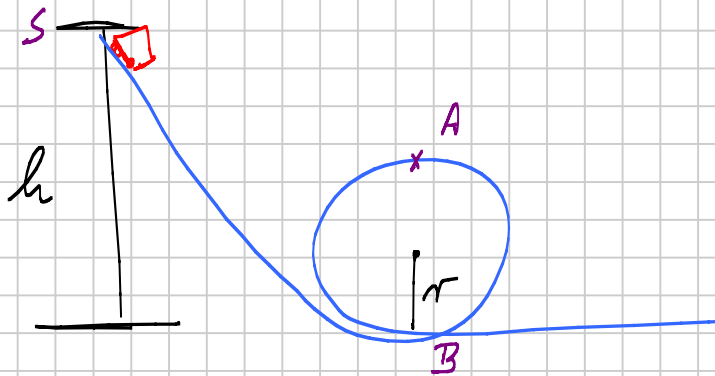


Angaben

Notiztitel

08.03.2007

Buch 591/7



potentielle Energie [J]

$$m \cdot g \cdot (h - 2r)$$

kinetische Energie

$$\frac{m}{2} \cdot v^2$$

Wagen soll nicht herausfallen

⇒ Zentrifugalkraft \geq Gewichtskraft

$$g(h - 2r) = \frac{1}{2} \cdot v^2$$

Energiebilanz

mit A

$$m \cdot r \cdot \omega^2 = m \cdot g$$

Radialkräfte

$$\text{mit } v = \omega \cdot r$$

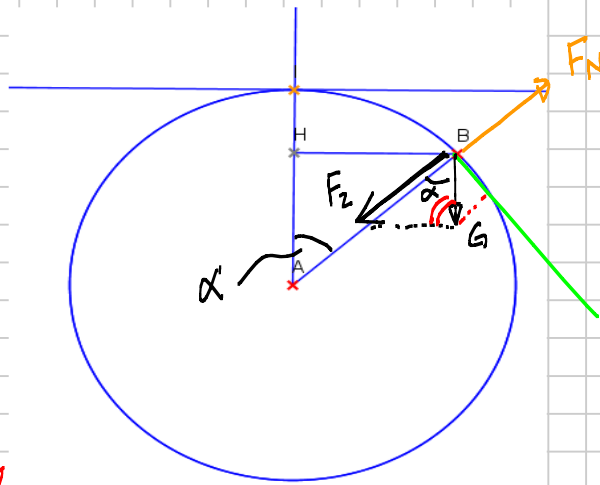
$$\omega = \frac{v}{r}$$

$$\frac{v^2}{r} = g$$

$$\frac{2g(h - 2r)}{r} = g$$

$$\begin{aligned} 2(h - 2r) &= r \\ 2h - 4r &= r \end{aligned}$$

$$2h = 5\pi \quad \Rightarrow \quad h = \frac{5}{2} \cdot \pi$$



$$\cos \alpha = \frac{G}{F_2}$$

$$\cos \alpha = \frac{g \cdot r}{v^2}$$

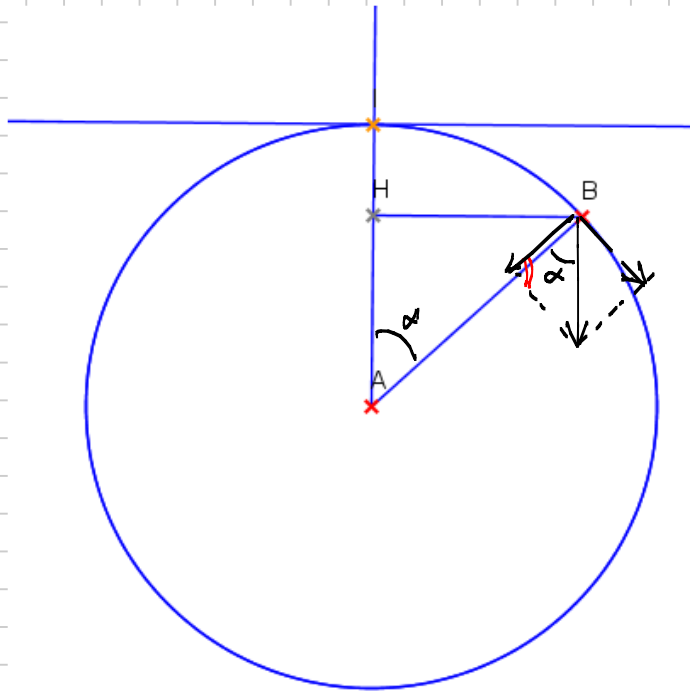
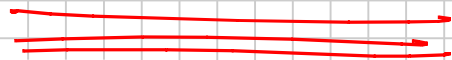
$$\cos \alpha = \frac{g \cdot r}{2gh}$$

$$\cos \alpha = \frac{r}{2h}$$

~~$$\frac{r-l}{r} = \frac{r}{2l}$$

$$2rh - 2h^2 = r^2$$~~

~~$$r^2 + 2l^2 - 2rh$$~~



$$\frac{m \frac{v^2}{r}}{m \cdot g} = \cos \alpha$$

$$\frac{v^2}{r g} = \cos \alpha$$

$$\frac{2gh}{r g} = \cos \alpha$$

$$\frac{2h}{r} = \cos \alpha$$

$$\begin{aligned} 2h &= r - l \\ 3h &= r \end{aligned}$$

$$\cos \alpha = \frac{r-l}{r}$$

$$\cos \alpha = \frac{3h-l}{3l} = \frac{2}{3}$$

$$\alpha = 48,18^\circ$$