20-R-VIB-DY-3

Elastic ropes w. tension T each (same).

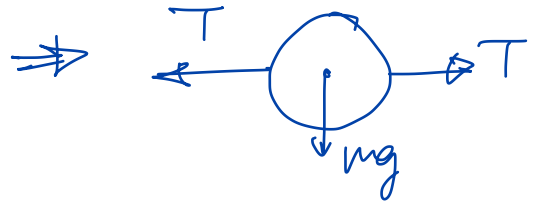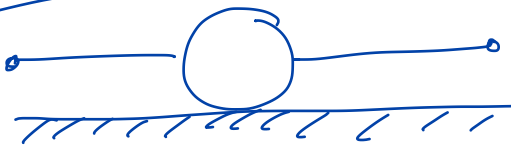initial
@
rest

$\uparrow T$

Y axis (up), X axis (right)

$\Sigma F_y: \cancel{T} - \cancel{T} - mg = 0$

$\Rightarrow mg = 0$ doesn't work

$\downarrow mg$

$\downarrow T$

Options:

horizontal

$\Rightarrow$

$\xleftarrow{T} \quad \xrightarrow{T} T$

$\downarrow mg$

$\Sigma F_x: T - T = 0$

unequal forces

$\uparrow T + mg$

$\downarrow mg$

$\downarrow T$
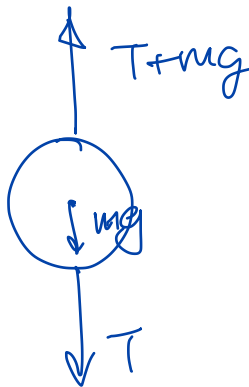
$\Sigma F_y: T + mg - mg - \cancel{T} = 0$

$0 = 0$

springs

$\downarrow x_{eq}$

$\downarrow x_{eq}$

$\uparrow F_s$

$\downarrow mg$

$\uparrow F_s$
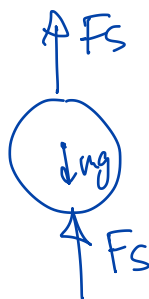
$\Sigma F_y: 2F_s - mg = 0$

$mg = 2F_s = 2kx_{eq}$

as you punch, stretch both
(increases top force, decreases
bottom force)