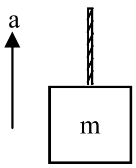
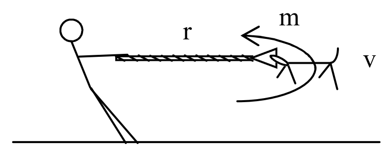
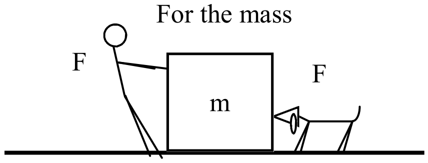


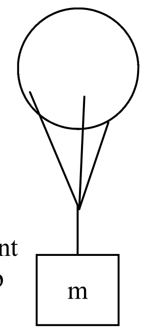
For Bim (the dog)



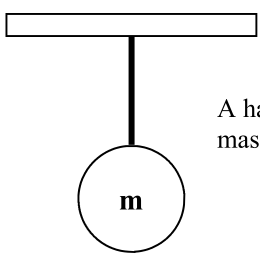
For the mass



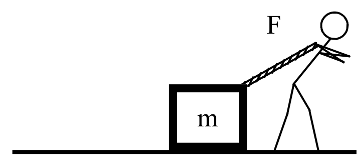
No friction



At constant speed up

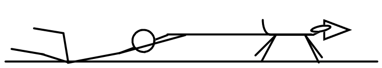


A hanging mass



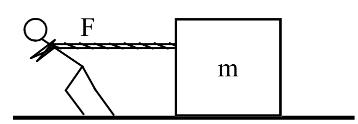
For the mass.
There is friction.

For Jim

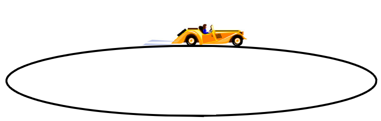


There is friction

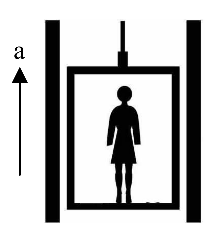
For the mass



No friction



Car driving around a corner.



For the elevator

For the person

$T = m(v^2/r)$
(v^2/r) is centripetal accel
Don't use mg, since x and y are independent

y:
$T - mg = ma$

y:
$T - mg = ma$
$a = 0$, so
$T = mg$

x:
none

y:
$F_N - mg = ma$
$a = 0$, so
$T = mg$

x:
$F_{Bim} - F_{Jim} = ma$

y:
$F_N - mg + T\sin\theta = 0$
So,
$F_N = mg - T\sin\theta$

x:
$T\cos\theta - F_k = ma$

y:
$T - mg = ma$
$a = 0$, so
$T = mg$

x:
$T = ma$
$a = neg$

y:
$F_N - mg = ma$
$a = 0$, so
$F_N = mg$

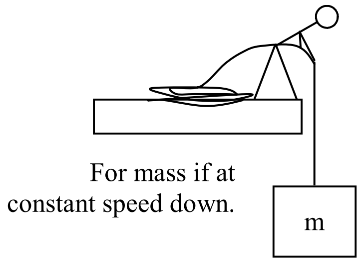
x:
$T = ma$
$a = pos$

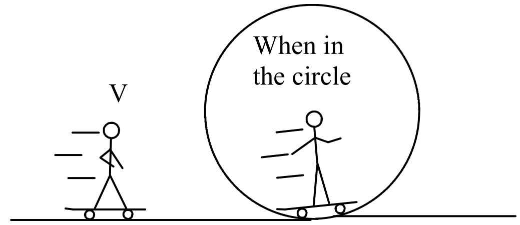
y:
$F_N - mg = ma$
$a = 0$, so
$F_N = mg$

elevator:
$T - mg = ma$

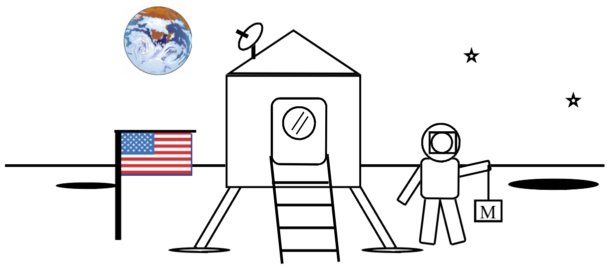
Person:
$F_N - mg = ma$
$a = +$, so
$F_N = mg + ma$

$F_f = m(v^2/r)$ and, since gripping:
$F_s = m(v^2/r)$
(v^2/r) is centripetal accel

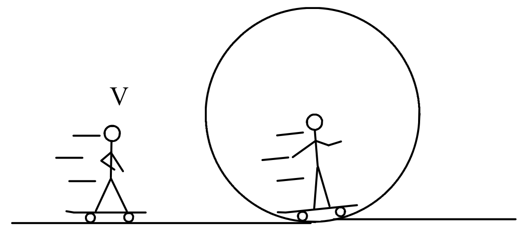




For the moon around the earth

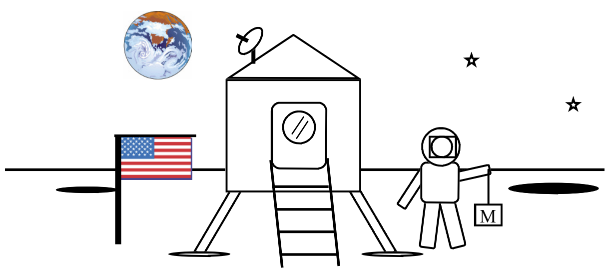


$g_{moon} = 1.63\ m/s^2$

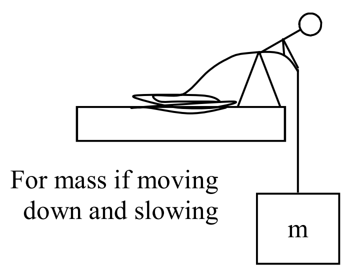


Before circle at
constant speed
Y—direction

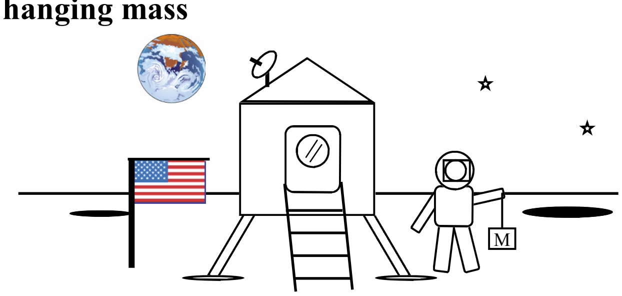
For Slim Jim



$g_{moon} = 1.63\ m/s^2$

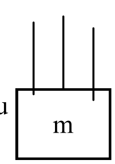


For the hanging mass

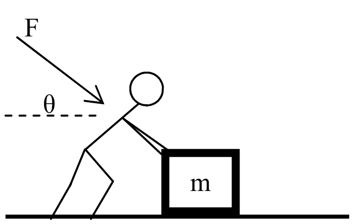


$g_{moon} = 1.63\ m/s^2$

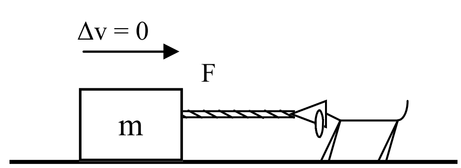
Falling thru
the air



no air friction

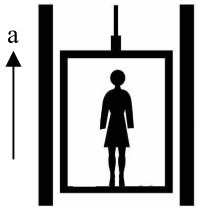


No friction

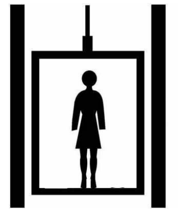


No friction

y: $F_N = m(v^2/r)$ (v^2/r) is centripetal acc., so means in a circle.	y: $T - mg = ma$ Constant speed: $a = 0$, so $T = mg$
x: None y: $F_N - mg = 0$ $F_N = mg$	$Fg = m(v^2/r)$ (v^2/r) is centripetal acc., so means in a circle.
y: $T - mg = ma$ a is + So $T = ma + mg$	y: $F_N - mg = ma$ $a = 0$, so $T = mg$ ($g = 1.63\ m/s^2$)
y: $-mg = ma$ m's cancel, so $a = -g$	y: $T - mg = ma$ $a = 0$, so $T = mg$ ($g = 1.63\ m/s^2$)
x: $T = ma$ $a = 0$ ($\Delta v = 0$) y: $F_N - mg = ma$ $a = 0$, so $T = mg$	y: $F_N - mg - T\sin\theta = 0$ So, $F_N = mg + T\sin\theta$ x: $T\cos\theta - F_k = ma$

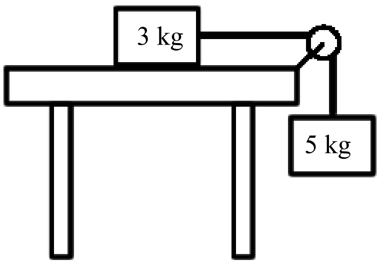


For the elevator

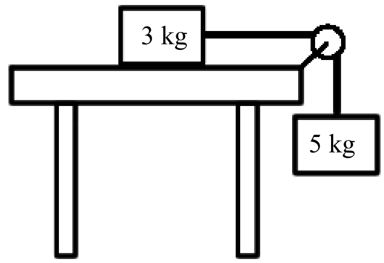


For the person between floors

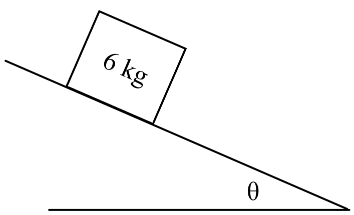
For the 3 kg mass. There is no friction.



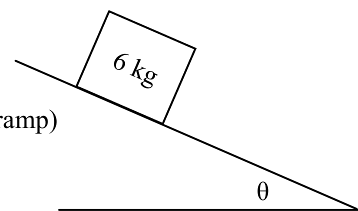
For the 3 kg mass. There is no friction.



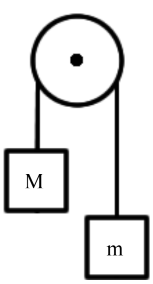
$\mu_s = 0.9$
$\mu_k = 0.5$

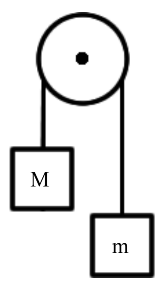


$\mu = 0$
(NO friction on ramp)

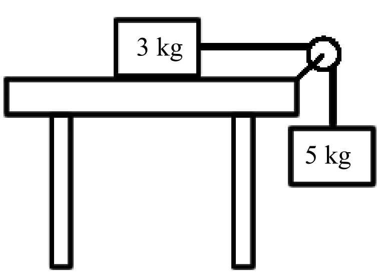


For the left mass.

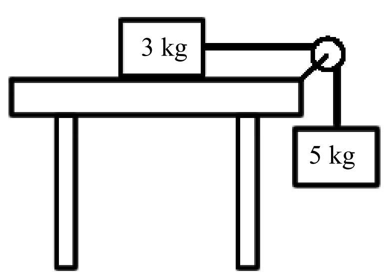




For the right mass.



For 3 kg mass. There is friction on the table.



For 3 kg mass. There is friction on the table.

y:
$F_N - mg = ma$
$a = 0$, so
$F_N = mg$

y:
$T_{cable} - mg = ma$

T direction:
$mg - T = ma$

Down is +

y:
$F_N - mg = 0$
So,
$F_N = mg$

T direction:
$T - F_f = ma$

right is +

x:
$Tx = ma$
And $Tx = mg\sin\theta$

y:
$F_N - mg\cos\theta = ma$
Since $a_y = 0$
$F_N = mg\cos\theta$

x:
$Tx - F_f = ma$
And $Tx = mg\sin\theta$

y:
$F_N - mg\cos\theta = ma$
Since $a_y = 0$
$F_N = mg\cos\theta$

T direction:
$mg - T = ma$

CW (down) is +

T direction:
$T - mg = ma$

CW (up) is +

T direction:
$mg - T = ma$

Down is +

y:
$F_N - mg = 0$
So,
$F_N = mg$

T direction:
$T - F_f = ma$

right is +