Bellwork

If you weigh 500N, what is your mass (kg)? If your apparent weight is 750N in an elevator, what is the elevator's acceleration?

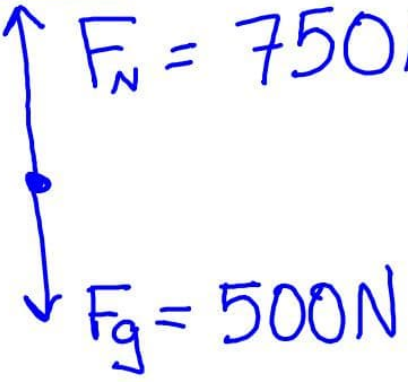
$F_N$

$$F_g = m\left(9.8 \tfrac{m}{s^2}\right)$$

$$500N = m\left(9.8 \tfrac{m}{s^2}\right)$$

$$\boxed{51\ kg = m}$$

FBD




$$\Sigma F = ma$$

$$+F_N - F_g = ma$$

$$750N - 500N = (51kg)\,a$$

$$\frac{250N}{51kg} = \boxed{a = 4.9 \tfrac{m}{s^2}}$$

HW Questions

1. 833N
2. 1003N
3. 578N
4. 0N
5. a) 666.4N
   b) 802.4N

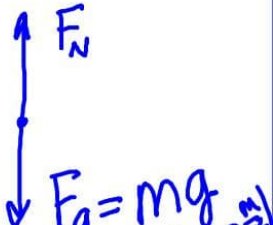
(5) $m = 68\,kg$ descending

a) constant speed
NO ACCEL.

$a = 0 \frac{m}{s^2}$

$\Sigma F = ma$

$+F_N - F_g = 0$




b) descending, slowing
− velocity
+acceleration

$\Sigma F = ma$

$F_N - F_g = (68\,kg)(+2.0\frac{m}{s^2})$

same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(2) b) $F_N = ?$

$a = +2.0 \frac{m}{s^2}$

$\Sigma F = ma$

$F_N - F_g = ma$

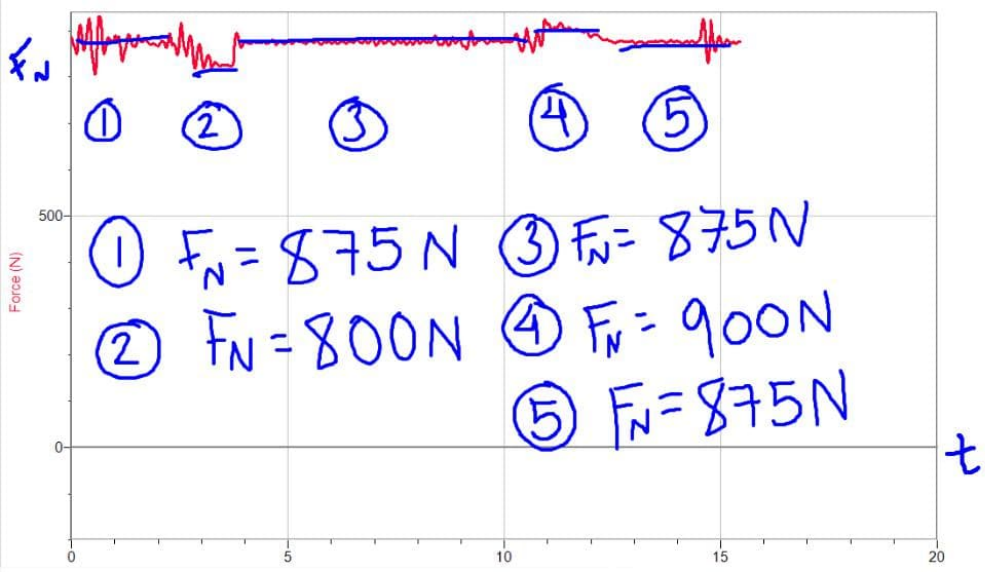
# Notes

Acceleration can be measured in "g's": $\boxed{1g = 9.8 \frac{m}{s^2}}$

- at at rest: $0 \frac{m}{s^2} = 0g$
- In free-Fall: $9.8 \frac{m}{s^2} = 1g$ (down)

$20 \frac{m}{s^2}$ in g?

$$20 \frac{m}{s^2} \cdot \frac{1\ g}{9.8 \frac{m}{s^2}} = \boxed{2.04g}$$




① $F_N = 875\,N$ ③ $F_N = 875N$

② $F_N = 800N$ ④ $F_N = 900N$

⑤ $F_N = 875N$

The graph shows the normal force $F_N$ acting on Kenny while he is:

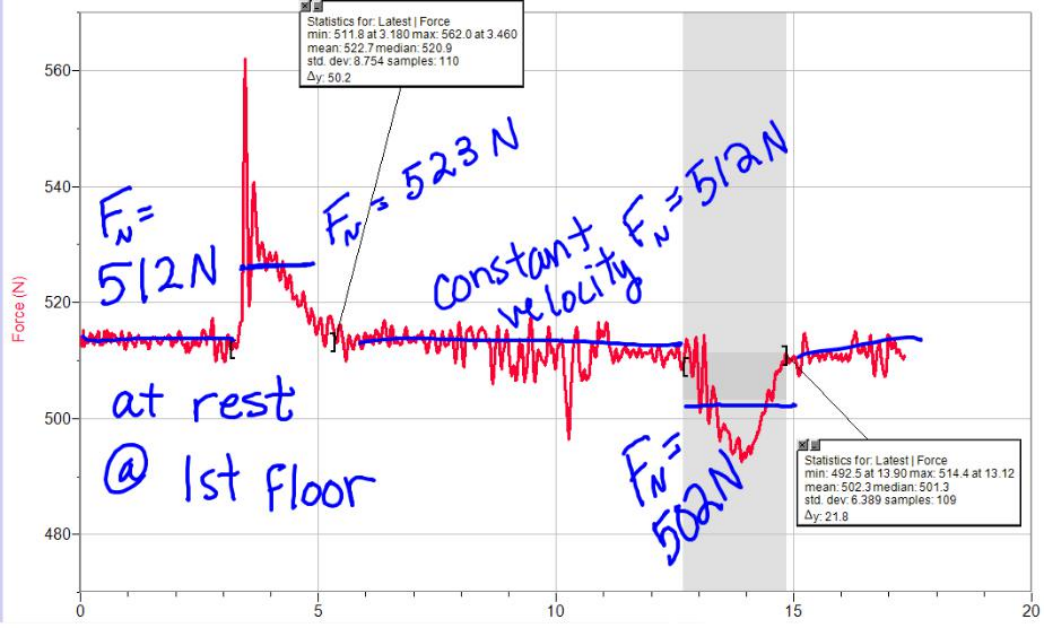
① at rest on 2nd Floor

② moving down & speeding up

③ moving down with Constant velocity

④ moving down & slowing down

⑤ at rest on 1st floor




This graph shows the normal force acting on Josie while she is:

1. at rest on the first floor
2. moving up and speeding up
3. moving up at a constant velocity
4. moving up and slowing down
5. at rest on the 2nd floor