Corrigés détaillés des exercices du chapitre 9 : lois de Newton

(14). on a $\Sigma F = ma = m\frac{\Delta v}{\Delta t} = m.\frac{v_f - v_i}{\Delta t}$ on cherche v_f

$\Rightarrow m.(v_f - v_i) = \Sigma F.\Delta t \Rightarrow mv_f = mv_i + \Sigma F.\Delta t$

$\Rightarrow v_f = v_i + \frac{1}{m}\Sigma F.\Delta t = 0 + \frac{1}{12}.15.6$

$= 7,5\ m/s$

(15).

b

(16). •Force résultante nulle = vitesse constante $\Rightarrow$ II et IV

•Force nette variable $\Rightarrow$ accélération variable $\Rightarrow$ I et V

(17). $F = ma = m\frac{\Delta v}{\Delta t} = m\frac{v_f - v_i}{\Delta t} = 250.\frac{50/3,6 - 0}{10} = 347N$

(18). On a $a = \frac{F}{m}$ (a). $a' = \frac{F}{\frac{1}{2}m} = 2.\frac{F}{m} = 2a = 6\ m/s^2$

⚠ $m = 2kg$; $m' = 1kg = \frac{m}{2}$

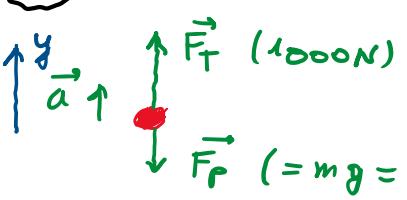
(b).

$a'' = \frac{F}{2m} = \frac{1}{2}\frac{F}{m} = \frac{1}{2}a = 1,5\ m/s^2$

$m'' = 4kg = 2m$

(19). $a = \frac{F}{m} = \frac{10'000}{2200} = 4,5\ m/s^2$

(20).



(a). Sur y : $\Sigma F : F_T - F_P = 1000 - 490,5$

$= 509,5N$

(b). $\Sigma F = 509,5\ N = ma$

$\Rightarrow a = \frac{509,5}{50} = 10,2\ m/s^2$

(c). $v_f = a.\Delta t = 30,6\ m/s$

(d). $d = v_{moy}.\Delta t = \frac{1}{2}(0 + v_f).3 = 45,9\ m$