① $m = 400\,dag = 4\,kg$

$h = 2\,m$

$E_{gp} = ?$

$E_{gp} = m \cdot g \cdot h$

$E_{gp} = 4\,kg \cdot 10\frac{N}{kg} \cdot 2\,m$

$E_{gp} = 40\,N \cdot 2\,m$

$E_{gp} = 80\,J$

② $m = 500\,g = 0{,}5\,kg$

$h = 1{,}5\,m$

$E_{gp} = ?$

$E_k = ?$

a) $E_{gp} = ?$

$E_{gp} = m \cdot g \cdot h$

$E_{gp} = 0{,}5\,kg \cdot 10\frac{N}{kg} \cdot 1{,}5\,m$

$E_{gp} = 5\,N \cdot 1{,}5\,m$

$E_{gp} = 7{,}5\,J$

b) $E_{gp} = E_k$

$E_k = 7{,}5\,J$

③ $m = 25\,kg$

$E_{gp} = 2{,}5\,kJ = 2500\,J$

$h = ?$

$E_{gp} = m \cdot g \cdot h$

$2500\,J = 25\,kg \cdot 10\frac{N}{kg} \cdot h$

$2500\,J = 250\,N \cdot h$

$h = 2500\,J : 250\,N$

$h = 10\,m$

④ $h = 30\,cm = 0{,}3\,m$

$E_{gp} = 30\,J$

$m = ?$

$E_{gp} = m \cdot g \cdot h$

$30\,J = m \cdot 10\frac{N}{kg} \cdot 0{,}3\,m$

$m = \frac{E_{gp}}{g \cdot h}$

$m = \frac{30\,J}{10\frac{N}{kg} \cdot 0{,}3\,m}$

$m = \frac{30}{3}\,kg$

$m = 10\,kg$

⑤

$F = 7\,N$

$s = 0{,}2\,km = 200\,m$

$W = ?$

$W = F \cdot s$

$W = 7\,N \cdot 200\,m$

$W = 1400\,J$

⑥

$F = 5\,N$

$W = 0{,}036\,kJ = 36\,J$

$s = ?$

$W = F \cdot s$

$36\,J = 5\,N \cdot s$

$s = \frac{36\,J}{5\,N}$

$s = 7{,}2\,m$

7. $t = 3\,min = 180\,s$
$W = 360\,kJ = 360\,000\,J$
$P = ?$

$P = \frac{W}{t}$

$P = \frac{360\,000\,J}{180\,s}$

$\boxed{P = 2000\,W}$

8. $G = 6\,kN = 6\,000\,N$
$h = s = 10\,m$
$t = 2\,min = 120\,s$
$P = ?$

$F = G$
$F = 6\,000\,N$
$W = F \cdot s$
$W = 6\,000\,N \cdot 10\,m$
$\boxed{W = 60\,000\,J}$

$P = \frac{W}{t}$
$P = \frac{60\,000\,J}{120\,s}$
$\boxed{P = 500\,W}$

9. $t = 1.5\,s$
$m = 156\,kg$
$h = s = 180\,cm = 1.8\,m$
$P = ?$

$G = m \cdot g$
$G = 156\,kg \cdot 10\,\frac{N}{kg}$
$F = G = 1560\,N$

$W = F \cdot s$
$W = 1560\,N \cdot 1.8\,m$
$W = 2808\,J$

$P = \frac{W}{t}$
$P = \frac{2808\,J}{1.5\,s}$
$\boxed{P = 1872\,W}$

10. $m = 40\,kg$
$h_1 = 5\,m$
$h_2 = 12\,m$
$E_{gp1} = ?$
$E_{gp2} = ?$

$E_{gp1} = m \cdot g \cdot h_1$
$E_{gp1} = 40\,kg \cdot 10\,\frac{N}{kg} \cdot 5\,m$
$\boxed{E_{gp1} = 2000\,J}$

$E_{gp_2} = m \cdot g \cdot h_2$
$E_{gp_2} = 40\,kg \cdot 10\,\frac{N}{kg} \cdot 12\,m$
$\boxed{E_{gp_2} = 4800\,J}$

$\Delta E_{gp} = E_{gp_2} - E_{gp_1}$
$\Delta E_{gp} = 4800\,J - 2000\,J$
$\boxed{\Delta E_{gp} = 2800\,J}$

11. $m = 50\,kg$
$s = 20\,m$
$\mu = 0,04$
$W = ?$

$G = m \cdot g$
$G = 50\,kg \cdot 10\,\frac{N}{kg}$
$G = 500\,N$

$F_{tr} = \mu \cdot G$
$F_{tr} = 0,04 \cdot 500\,N$
$F_{tr} = 20\,N$

$W = F \cdot s$
$W = 20\,N \cdot 20\,m$
$\boxed{W = 400\,J}$

12. $P = 5\,kW = 5000\,W$
$F = G = 3,6\,kN = 3\,600\,N$
$t = 4\,min = 240\,s$
$h = ?$

$P = \frac{W}{t}$
$W = P \cdot t$
$W = 5000\,W \cdot 240\,s$
$W = 1\,200\,000\,J$

$W = F \cdot h$

$h = \frac{W}{F}$

$h = \frac{1\,200\,000\,J}{3600\,N}$

$h = 333,33\,m$

(13) $P = 360\,W$

$m = 0{,}24\,t = 240\,kg$

$h = 3\,dm = 0{,}3\,m$

$t = ?$

$W = m \cdot g \cdot h$

$W = 240\,kg \cdot 10\frac{N}{kg} \cdot 0{,}3\,m$

$W = 720\,J$

$P = \frac{W}{t}$

$360\,W = \frac{720\,J}{t}$ $\quad t = 2\,s$

$t = \frac{W}{P}$

$t = \frac{720\,J}{360\,W}$

(14) $G = 50\,N$

$s = 65\,cm = 0{,}65\,m$

$\mu = 20\% = 0{,}2$

$W = ?$

$F_{TR} = ?$

$G = F$

$F_{TR} = F$

$F_{TR} = \mu \cdot G$

$F_{TR} = 0{,}2 \cdot 50\,N$

$F_{TR} = 10\,N$

$W = F \cdot s$

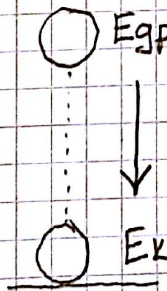
$W = 10\,N \cdot 0{,}65\,m$

$W = 6{,}5\,J$

(15) $m = 1\,g = 0{,}001\,kg$

$h = 100\,m$

$E_k = ?$



$E_{gp} = m \cdot g \cdot h$

$E_{gp} = 0{,}001\,kg \cdot 10\frac{N}{kg} \cdot 100\,m$

$E_{gp} = 1\,J$

$E_k = E_{gp} = 1\,J$

16. $m = 0{,}45\,kg$
$h_1 = 1{,}8\,m$
$h_2 = 1{,}2\,m$

$E_{gp1} = m \cdot g \cdot h_1$
$E_{gp1} = 0{,}45\,kg \cdot 10\,\frac{N}{kg} \cdot 1{,}8\,m$
$E_{gp1} = 8.1\,J$

$E_{gp2} = m \cdot g \cdot h_2$
$E_{gp2} = 0{,}45\,kg \cdot 10\,\frac{N}{kg} \cdot 1{,}2\,m$
$E_{gp2} = 5.4\,J$

$\Delta E = E_{gp1} - E_{gp2}$
$\Delta E = 8.1\,J - 5.4\,J$
$\boxed{\Delta E = 2.7\,J}$

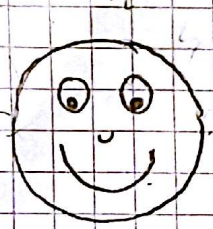
17. $m = 2\,kg$
$h = 0{,}8\,m + 3 \cdot 3{,}4\,m = 11\,m$

$W = ?$
$W = m \cdot g \cdot h$
$W = 2\,kg \cdot 10\,\frac{N}{kg} \cdot 11\,m$
$W = 220\,J$

18. $P = 500\,W$
$V = 10\,m^3 = 10000\,dm^3 = 10000\,l \Rightarrow m = 10000\,kg$
$h = 20\,m$

$t = ?$
$W = m \cdot g \cdot h$
$W = 10000\,kg \cdot 10\,\frac{N}{kg} \cdot 20\,m$
$W = 2\,000\,000\,J$

$t = \frac{W}{P}$
$t = \frac{2\,000\,000\,J}{500\,W}$
$t = 4000\,s$



GRUPA C

① $m = 400dag = 4kg$
$h = 2m$

$E_{gp} = ?$
$E_{gp} = m \cdot g \cdot h$
$E_{gp} = 4kg \cdot 10\frac{N}{kg} \cdot 2m$
$E_{gp} = 80J$

② $m = 500g = 0,5kg$
$h = 1,5m$

$E_{gp} = ?$
$E_{gp} = m \cdot g \cdot h$
$E_{gp} = 0,5kg \cdot 10\frac{N}{kg} \cdot 1,5m$
$E_{gp} = 7,5J$

③ $m = 25kg$
$E_{gp} = 2,5kJ = 2500J$

$h = ?$
$h = \frac{E_{gp}}{m \cdot g}$
$h = \frac{2500J}{25kg \cdot 10\frac{N}{kg}}$
$h = \frac{2500J}{250N}$
$h = 10m$

④ $h = 30cm = 0,3m$
$E_{gp} = 30J$

$m = ?$
$m = \frac{E_{gp}}{g \cdot h}$
$m = \frac{30J}{10\frac{N}{kg} \cdot 0,3m}$
$m = \frac{30}{3}kg$
$m = 10kg$

⑤ $F = 7N$
$s = 0,2km = 200m$

$W = ?$
$W = F \cdot s$
$W = 7N \cdot 200m$
$W = 1400J$

⑥ $F = 5N$
$W = 0,036kJ = 36J$

$s = ?$
$s = \frac{W}{F}$
$s = \frac{36J}{5N}$
$s = 7,2m$

⑦ $s = 5m$
$W = 90J$

$F = ?$
$W = F \cdot s$
$90J = F \cdot 5m \mid :5m$
$F = 90J : 5m$
$F = 18N$

⑧ $t = 3min = 180s$
$W = 360kJ = 360\,000J$

$P = ?$
$P = \frac{W}{t}$
$P = \frac{360000J}{180s}$
$P = 2000W$

⑨ $G = 6kN = 6000N$
$h = 10m$
$t = 2min = 120s$

$P = ?$
$W = G \cdot h$
$W = 6000N \cdot 10m$
$W = 60000J$
$P = \frac{W}{t}$
$P = \frac{60000J}{120s}$
$P = 500W$

(10) $P = 420W$
$W = 756kJ = 756000J$

$t = ?$

$P = \frac{W}{t}$

$420W = \frac{756000J}{t} \mid \cdot t$

$420W \cdot t = 756000J \mid : 420W$

$t = 756000J : 420W$

$t = 1800s$

$t = 0,5h$

(11) $P = 180W$
$t = 1d = 24h = 86400s$

$W = ?$

$W = P \cdot t$

$W = 180W \cdot 86400s$

$W = 15552000J$

(12) $t = 1,5s$
$m = 156kg$
$h = 180cm = 1,8m$

$P = ?$

$W = m \cdot g \cdot h$

$W = 156kg \cdot 10\frac{N}{kg} \cdot 1,8m$

$W = 2808J$

$P = \frac{W}{t}$

$P = \frac{2808J}{1,5s}$

$P = 1872W$

(13) $m = 1g = 0,001kg$
$h = 100m$

$E_k = ?$

$E_{gp} = E_k$

$E_{gp} = m \cdot g \cdot h$

$E_{gp} = 0,001kg \cdot 10\frac{N}{kg} \cdot 100m$

$E_{gp} = 1J$

$E_k = E_{gp} = 1J$