1) $K.E = P^2/2m$, If K.E is increased 300%

$K.E' = KE + \frac{300(KE)}{100}$

$K.E' = KE + 3KE = 4K.E.$

$K.E' = P'^2/2m = \frac{4P^2}{2m}$

$\Rightarrow P'^2 = 4P^2$

$\Rightarrow P' = \sqrt{4P^2} = 2P$

% Change in momentum $= \frac{P' - P}{P} \times 100$

$\Rightarrow \frac{2P - P}{P} \times 100 = 100\%$

2) $P_H = \left(\frac{V}{R + R_H}\right)^2 - R_H$

$\Rightarrow \left(\frac{V}{100 + R_H}\right)^2 - R_H$

$P_H' = \left(\frac{V}{200 + R_H}\right)^2 - R_H$

$\frac{P_H'}{P_H} = \left(\frac{200 + R_H}{100 + R_H}\right)^2 = 4$ times

3) c) Both will come to rest in Same direction

4) SA = 45 x 10 = 450 cm or 4.5 m

$P = \frac{FS}{t} = \frac{mg \times h}{t} = \frac{60 \times 10 \times \cancel{4.5}^{0.5}}{\cancel{9}} = 300W$

5) $KE = \frac{P^2}{2m}$

$P_{initial} = P$

$P_{final} = 3P$

Since $K.E \propto P^2$

$$\frac{KE_i}{KE_f} = \frac{P_i^2}{P_f^2} \Rightarrow \frac{P^2}{9P^2}$$

$KE_f = 9\, KE_i$

If initial kinetic energy is 100J final K.E.)

$KE_f = 9 \times 100 = 900J$

6) $m = 1000kg$, $h = 12m$

$$P = \frac{W}{t} = \frac{Fs}{t} = \frac{mgh}{t} = \frac{1000 \times 10 \times 12}{60} = 2000W$$

$1 HP = 746W$

$$\frac{2000}{746} = 2.63 \, HP$$