$\frac{1}{2}m(8000\ m/s)^2 - 6.3\times10^7\ J = U_{highest\ point}$

$= -3.1\times10^7\ J$

c) -4.2×10^7 J

d) -3.1×10^7 J

e) None of the above.

Two kids of masses 20 kg and 40 kg climb a 8 m and 30 kg ladder that leans against a wall at an angle of 60°. When the 20 kg kid is on top of the ladder and the 40 kg kid is half way up, answer the following questions: (**Assume that there is only friction on the floor and use gravity as 10m/s²**).

6) The magnitude of the normal force exerted by the floor on the bottom of the ladder is:

a) 900 N

b) 318 N

c) 600 N

d) 214 N

e) 425 N

$F_N = (20kg)(10\ m/s^2) + (40kg)(10\ m/s^2) + (30kg)(10\ m/s^2) = 900\ N$

7) The magnitude of the normal force exerted by the wall on the top of the ladder is:

a) 900 N

b) 318 N

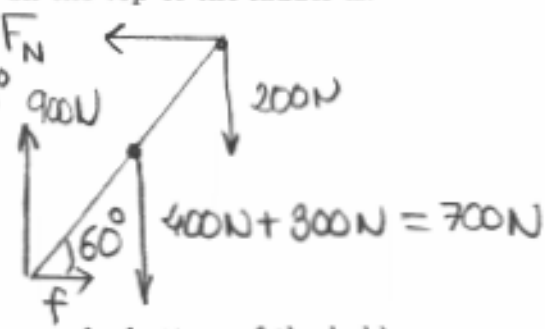
c) 600 N

d) 214 N

e) 425 N

$0 = \tau_{NET,\ bottom\ point} = F_N(8m)\sin60° - (700N)(4m)\cos60° - (200N)(8m)\cos60°$

$\rightarrow F_N = 317.5\ N$



8) The magnitude of the friction force exerted by the floor on the bottom of the ladder is:

a) 900 N

b) 318 N

c) 600 N

d) 214 N

e) 425 N

FRICTION = NORMAL FORCE EXERTED by the WALL

$= 317.5\ N$

9) The **minimum** value for the coefficent of static equilibrium to keep the ladder in place is:

a) 0.16

b) 0.35

c) 0.40

$f = F_S^{MAX} = (900N)\mu_S$

$\rightarrow \mu_S = \frac{318}{900} = 0.35$