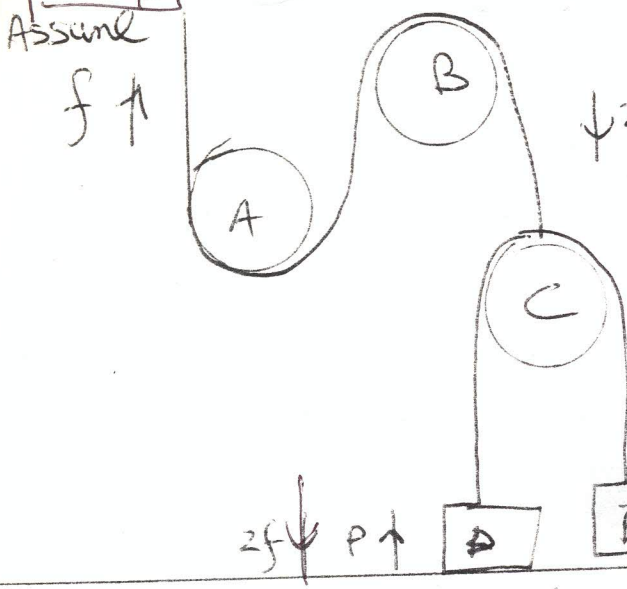
1984

Assume



Let f be the acceleration of pulley A.
Let p be the acceleration of D relative to pulley C.

A	B	C	D	E
8 kg	fixed	0	2kg	4kg
Ass				
accel. f ↑		2f ↓	P↑2f↓	P↓2f↓
forces S↑ ↑S ↓8g	Ex A	↑S T↓ ↓T	↑T ↓2g	↑T ↓4g
I 2S − 8g = 8f (1)		S − 2T = 0 (2)	2g − T = 2(2f − P) (3)	4g − T = 4(P+2f) (4)

want to find f and p don't need S and T.

1) $2S - 8g = 8f$
2) $S - 2T = 0$] Sub ⇒ $4T - 8g = 8f \Rightarrow T - 2g = 2f$ (*) NoS
3) $T - 2g = 2p - 4f$
4) $4g - T = 4p + 8f$] Add ⇒ $2g = 6p + 4f$ (Δ) ⇒ $g = 3p + 2f$ (Δ)

(□) ⇒ $g = 2p + 5f$ (□)

Add (4) and (*) ⇒ $2g = 4p + 10f$

Now just (!) solve (Δ) and (□)

(Δ) × 2 ⇒ $2g = 6p + 4f$
(□) × 3 ⇒ $3g = 6p + 15f$
subtract ⇒ $-g = -11f \Rightarrow f = \frac{g}{11}\ ms^{-2}$

(Δ) ⇒ $g = 3p + 2\left(\frac{g}{11}\right)$
⇒ $p = \frac{3g}{11}\ ms^{-2}$

So Accel A = $\frac{g}{11}\ ms^{-2}$	Accel C = $\frac{2g}{11}\ ms^{-2}$	Accel D = $\frac{3g}{11} - \frac{2g}{11} = \frac{g}{11}\ ms^{-2}$	Accel E = $\frac{5g}{11}$ (2f + p)