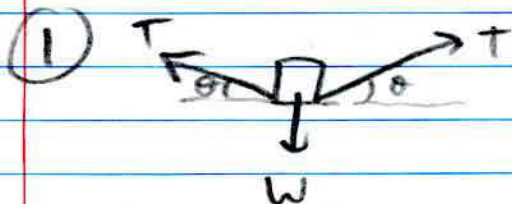


Version A

Quiz 3: Solutions



so $y) T \sin \theta + T \sin \theta = W$

$2T \sin \theta = W$

$T = \frac{W}{2 \sin \theta}$

If θ is small,

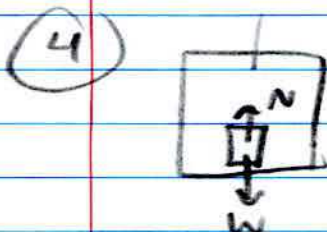
$T \gg W$



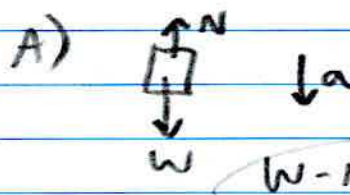
const v means $\Sigma F = 0$

so $5 = 3 + F_f \rightarrow F_f = 2N, \text{ left}$

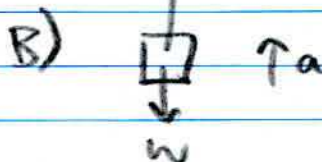
3) B



scale shows N

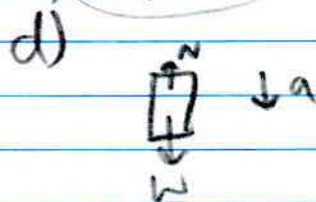


$W - N = ma$



$N - W = ma$

C) $W = N$



$W - N = ma$

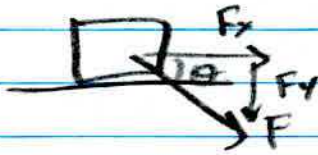
e) $W = N$

so A, D: $N = W - ma$

B: $N = W + ma$

(highest)

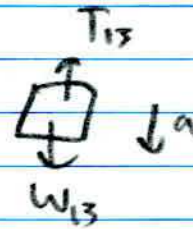
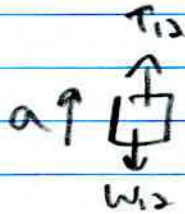
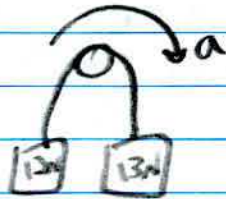
5



so x) $F_x = \text{max}$

$$a_x = \frac{F \cos \theta}{m} = 0.75 \text{ m/s}^2$$

6



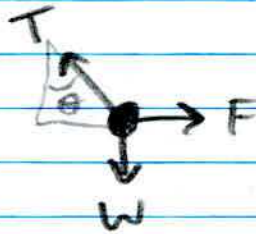
$$T_{12} = T_{13}$$

$$12N) T - (12N) = \left(\frac{12}{g}\right) a$$

$$13N) (13N) - T = \left(\frac{13}{g}\right) a$$

$$\rightarrow a = \frac{1}{25} g$$

7



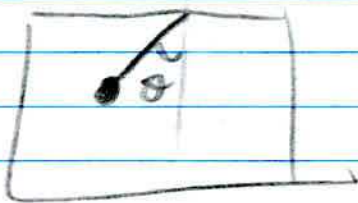
$$(x) T \sin \theta = F$$

$$(y) T \cos \theta = W$$

$$\text{so } \frac{(x)}{(y)} \Rightarrow \tan \theta = \left(\frac{2}{1}\right) \rightarrow \theta = 63.4^\circ$$

$$\therefore (y) T = \frac{1}{\cos \theta} = 2.34 \text{ N}$$

8



$$(x) T \sin \theta = \text{max}$$

$$(y) T \cos \theta = mg$$

$$\text{so } \frac{(x)}{(y)} \Rightarrow \tan \theta = \frac{\text{max}}{g}$$

$$\theta = \tan^{-1} \left(\frac{a_x}{g} \right)$$

$$= 17^\circ$$