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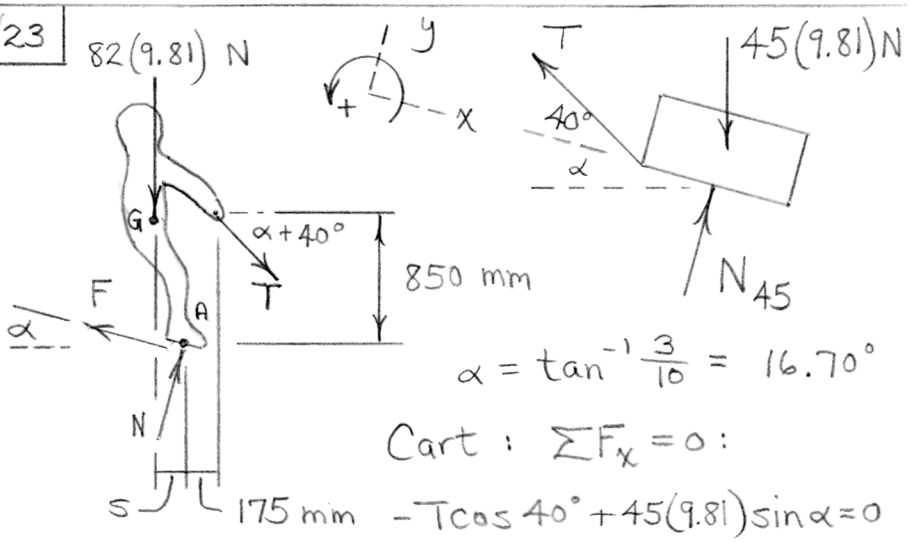

$\alpha = \tan^{-1}\frac{3}{10} = 16.70°$

Cart: $\Sigma F_x = 0$:

$-T\cos 40° + 45(9.81)\sin\alpha = 0$

$T = 165.6$ N

Man:

$\Sigma F_x = 0$: $-F + 82(9.81)\sin\alpha + 165.6\cos 40° = 0$

$F = 358$ N

$\Sigma F_y = 0$: $N - 82(9.81)\cos\alpha - 165.6\sin 40° = 0$

$N = 877$ N

$\mu_s = \frac{F}{N} = \frac{358}{877} = \underline{0.408}$

$\Sigma M_A = 0$: $82(9.81)s - 165.6\cos(\alpha+40)(850)$

$- 165.6\sin(\alpha+40)(175) = 0$

$\underline{s = 126.2 \text{ mm}}$