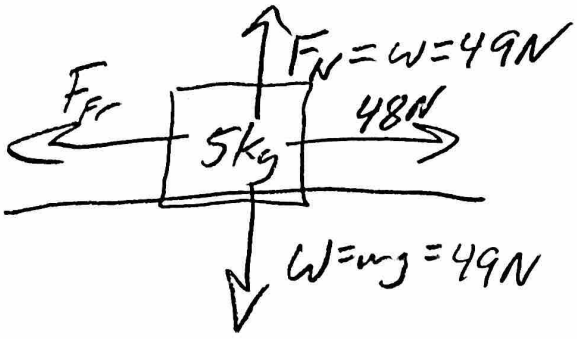
37.



a) To "start" acceleration must be slightly more than zero. Find value that gives zero acceleration, Force must be slightly higher

$\Sigma F = 48N - F_{fr}$

$\Sigma F = 5kg(0)$

$48N - F_{fr} = 0$

$48N = F_{fr} = \mu_s F_N$

$48N = \mu_s (49N)$

$\boxed{\mu_s = 0.98}$

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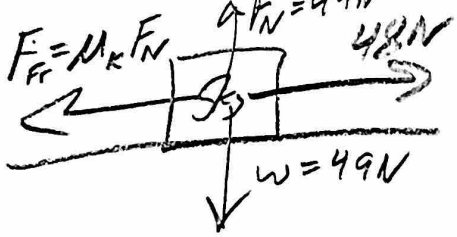
b) Now box accelerates @ $0.7 m/s^2$ ...



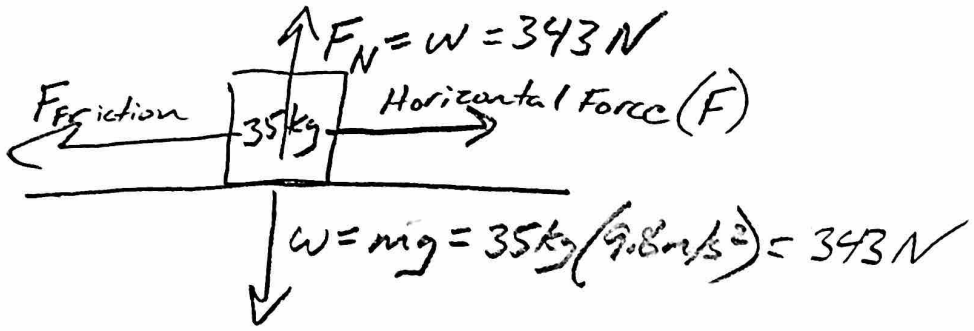
$\Sigma F = 48N - F_{fr} = 48N - \mu_k (49N)$

$\Sigma F = 5kg\,(0.7 m/s^2)$

$5kg\,(0.7 m/s^2) = 48N - \mu_k (49N)$

$\boxed{\mu_k = 0.91}$

36.



* I know $F_N = w$, because there is no acceleration in the y dimension, so $\Sigma F_y = 0$, so $F_N - w = 0$

* speed is constant, so $a = 0$ in x dimension, so $\Sigma F_x = ma = 0$

Writing ΣF equations for x dimension...

Vector Sum of forces → $\Sigma F_x = F_{Horiz} - F_{friction}$

Newton's 2nd Law → $\Sigma F = 35kg\,(0 m/s^2)$

Substituting...

$F_{Horiz} - F_{Frict.} = 0$ $\qquad F_{Fr} = \mu_k (F_N$

$F_{Horiz} = F_{Frict}$

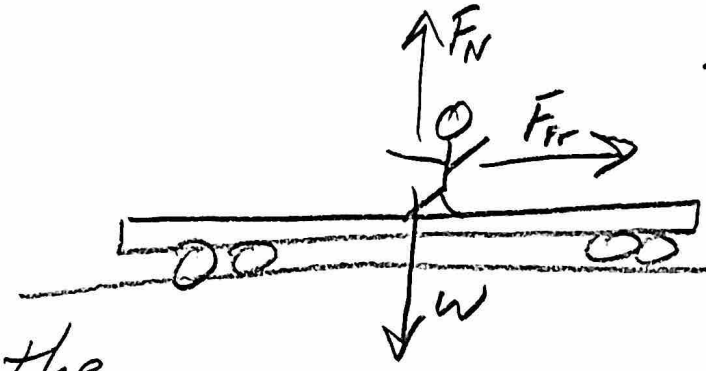
$F_{Horiz} = \mu_k F_N$

$$F_{Horiz} = 0.3(343N) = 102.9\,N$$

if $\mu_k = 0$,

$$F_{Horiz} = 0(343N) = 0\,N$$

38.

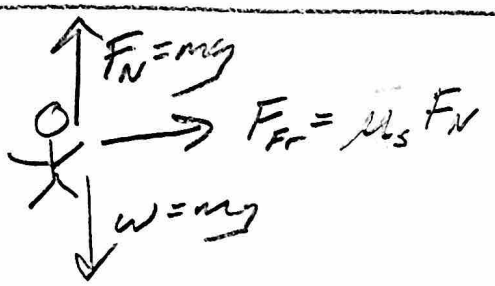


* Friction is the force pushing you forward!

In the Y dimension → $\sum F_y = F_N - W$

$\sum F_y = 0$ ← No up or down acceleration

So, $F_N - W = 0 \Rightarrow F_N = W = mg$



In the X dimension → $\sum F = F_{Fr} = \mu_s F_N = \mu_s mg$

$\sum F = ma = m(0.2g)$

So... $m(0.2g) = \mu_s mg$

$0.2g = \mu_s g$

$0.2 = \mu_s$