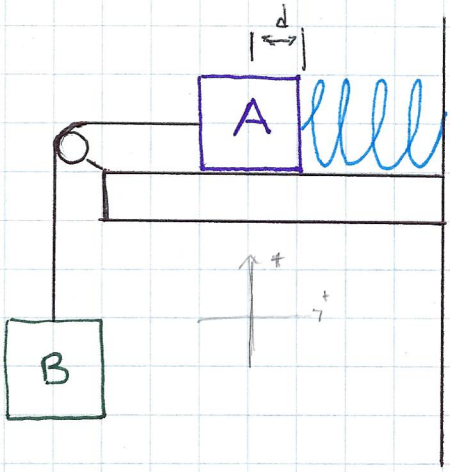
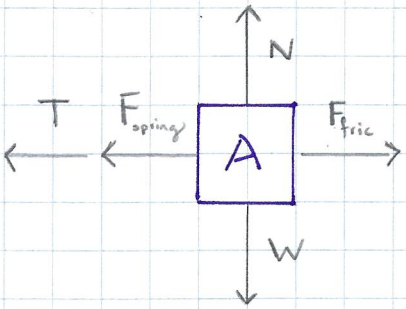
# 20-P-FA-AF-003

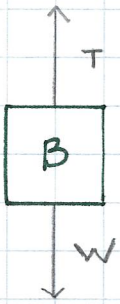
Multi-dimensional Motion: Intermediate

Q: The friction coefficient is U and both blocks has a mass of M kg. When the spring is compressed D m, block A experiences an acceleration of A m/s, w/ k val of K
to the left
What is the acceleration of block B?

A:




$|F_{spring}| = K \cdot D$, $|F_{fric}| = U \cdot N$, $N = W = M \cdot g$

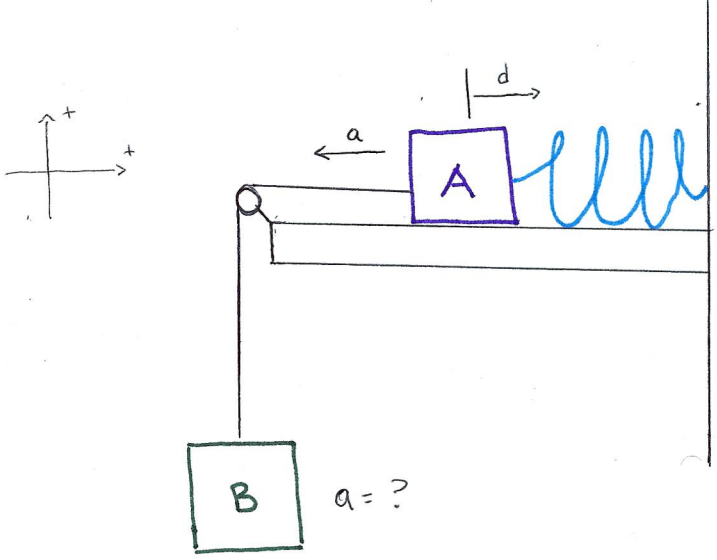
for block A

$\uparrow + \sum F_y = 0 = N - W \Rightarrow N = W$

$\rightarrow + \sum F_x = F_{fric} - T - F_{spring} = UN - T - KD = MA \Rightarrow UN - KD - MA = T$

for block B

$\uparrow + \sum F_y = M \cdot a_B = T - W \Rightarrow a_B = \frac{T - M \cdot g}{M} = \frac{UN - KD - MA - M \cdot g}{M}$


+
+
d
a
A
B
a = ?