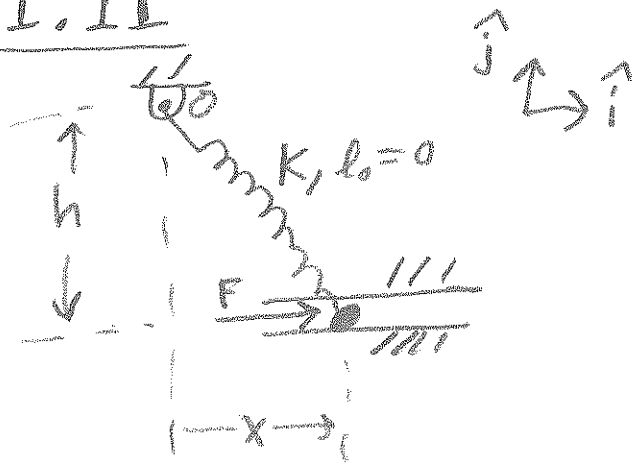
6.1.11



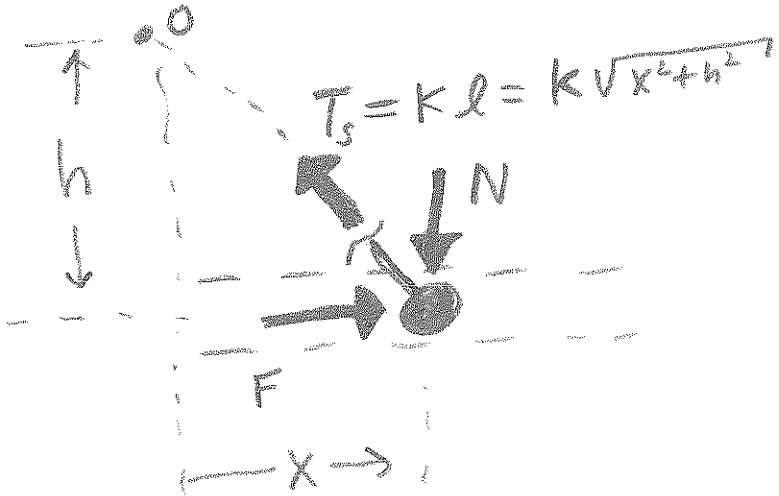
Given k, $l_0 = 0$, h, F

Find x

$F = 1000\ N$

$k = 50{,}000\ N/m$

FBD



$$\sum F_x = 0 \Rightarrow \quad F - T_s \frac{x}{l} = 0 \Rightarrow \quad F = kx$$

($T_s = kl$)

$$\Rightarrow \boxed{x = F/k}$$

[This nice answer only works out for zero-rest-length springs! ($l_0 = 0$)]

$$\boxed{x = \frac{1000\ N}{50{,}000\ N/m} = 2\ cm}$$