$k_1 = 25$ $F = kx$

$k_2 = 50$

Parallel

$k_{eq} = k_1 + k_2$

$\Sigma F = F_1 + F_2$

$x = \frac{F_1}{k_1} = \frac{F_2}{k_2}$

Series

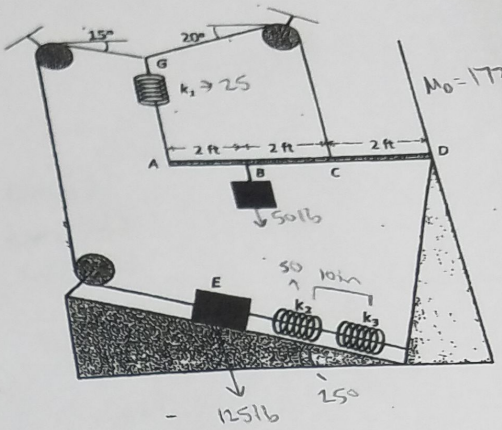
$\frac{1}{k_{eq}} = \frac{1}{k_1} + \frac{1}{k_2}$

$\Sigma x = x_1 + x_2$

$F = k_1 x_1 = k_2 x_2$

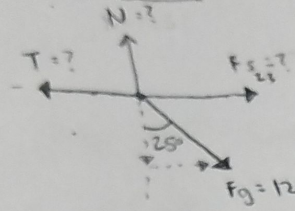
2. For the system shown below, the weight of block *B* is 50 lb and block *E* is 125 lb. The spring constants for springs k_1 and k_2 are 25 lb/in and 50 lb/in, respectively. If the magnitude of the moment about point *D* is 1720 lb-ft, determine

a) the maximum amount that the spring k_1 can be stretched;
b) the normal force exerted on block *E* by the ramp; and
c) the spring constant k_3 if springs k_2 and k_3 are stretched a combined distance of 10 in.



b)

FBD @ E



(+) $\Sigma F_x = F_s + 125\sin(25°) - T = 0$

(+↑) $\Sigma F_y = N - 125\cos.(25°) = 0$

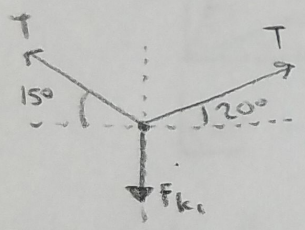
$\boxed{N = 113.2881\text{b}}$

c) $F = k_1 x_1 = k_2 x_2$

$= 50(10)$

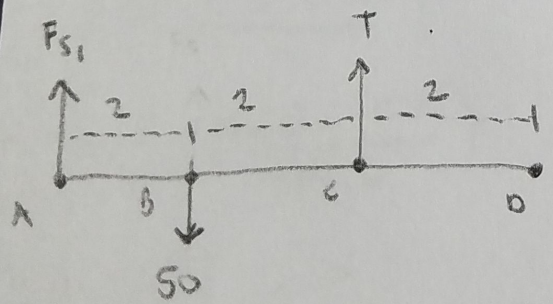
$F = 500\text{ lb-in}$

FBD @ B



a)

FBD @ D



$+\circlearrowleft \Sigma M_D = -F_{s_1}(6) + 50(4) - T(2)$

$1720 = 200 - 6F_{s_1} - 2T$