Problem M1 Solutions

1) By symmetry $R_{Ac} = R_{Ad} = R$

Apply equilibrium in y dir

$F = R_{Ac} \sin 30 - R_{Ad} \sin 30^\circ = 0$

$F = 2 \times R \times 0.5 = R$ \implies $R_{Ac} = R_{Ad} = F$

2) $\delta_{Ac} = \delta_{Ab} = \frac{R}{K}$

3) Each spring extends by $\delta = \frac{R}{K}$
Each spring can rotate about its fixed end
springs remain attached at point A.

Circular curves to represent rotation of extended spring about anchor point.

New position of A consistent with extension and rotation of two springs.
Enlarge key region, assume small deflections allow us to ignore circular arcs

\[ \Delta \sin 30^\circ = \delta \]

\[ \Delta = 2\delta = \frac{2F}{K} \]