A collapsible auto radio antenna has as many DoF as there are sections, less one.

Counting the stop as a half joint:

\[ L = 6 \quad J_1 = 7 \quad J_2 = 1 \quad \rightarrow \quad M = 0 \]

Removing the stops:

\[ L = 6 \quad J_1 = 7 \quad J_2 = 0 \quad \rightarrow \quad M = 1 \]

All the joints are full joints, except for the stop which is a half joint.
2.68. Two ternary links are sharing a joint and also one of alined links connecting them is grounded since it is held somewhere.

\[ \text{\textbf{K}} \]

\[ \begin{align*}
\alpha_6 \cdot \text{atan} \left( \frac{\alpha_6 \cdot \text{tan} \theta - \alpha_6 \cdot \text{tan} \phi}{\alpha_6 \cdot \text{sec} \theta} \right) &= \theta = 9.17 \\
AB &= \sqrt{(x^2 + y^2)} = 3 \\
S + L &= 7.48 + 7.96 \quad \Rightarrow C = 15.44 \\
\Rightarrow \text{The friction, } \eta = 0.05 \\
\end{align*} \]
Figure P2-24 shows a slider linkage. a) Is it a Watt or Stephenson linkage? b) Determine its inversion, i.e., is it a type I, II, or III?

a) Watt
b) Type I
Figure P2-4
2-3 a. knee $M = 1$
   b. ankle $M = 3$
   c. shoulder $M = 3$
   d. hip $M = 3$
   e. knuckle $M = 2$

Spherical joint

FIGURE P2-21

2-58 Figure P2-21a shows a “Nuremberg scissors” mechanism. Find its mobility.

2-59 Figure P2-21b shows a mechanism. Find its mobility and classify its isomer type.

2-60 Figure P2-21c shows a circular saw mounted on the coupler of a fourbar linkage. The centerline of the sawblade is at a coupler point that moves in an approximate straight line. Draw its kinematic diagram and determine its mobility.

2-61 Figure P2-21d shows a log transporter. Draw a kinematic diagram of the mechanism, specify the number of links and joints, and then determine its mobility:
   a) For the transporter wheels locked and no log in the claw.
   b) For the transporter wheels locked with it lifting a log.
   c) For the transporter moving a log to a destination in a straight-line.

2-62 Figure P2-21e shows a plow mechanism attached to a tractor. Draw its kinematic diagram and find its mobility including the earth as a “link.”
   a) When the tractor is stopped and the turnbuckle is fixed. (Hint: Consider the tractor and wheel to be one with the earth.)
   b) When the tractor is stopped and the turnbuckle is being adjusted. (Same hint.)
   c) When the tractor is moving and the turnbuckle is fixed. (Hint: Add the moving tractor’s DOF to those found in part a.)

L = 9 $J = 11$

$M = 3L - 2J = 3(9-1) - 2\times 11 = 2$