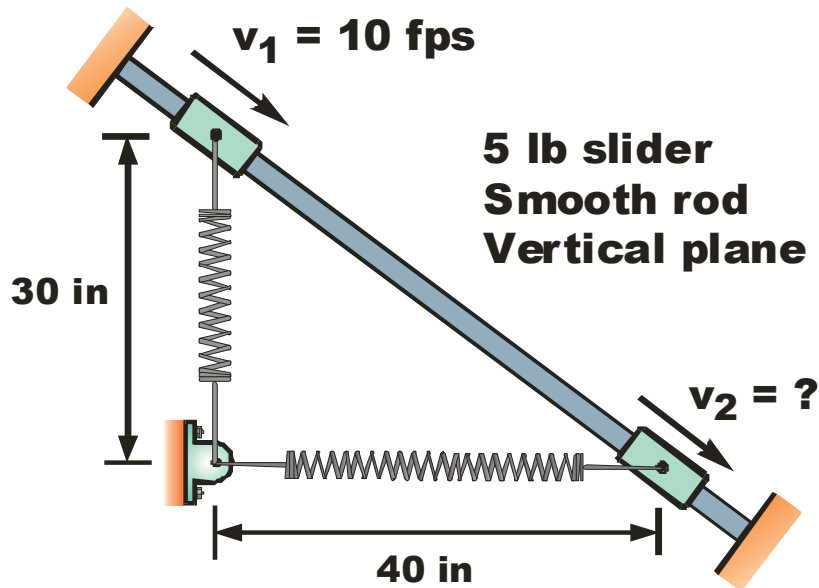


Particle Work Energy: Example Problem 1

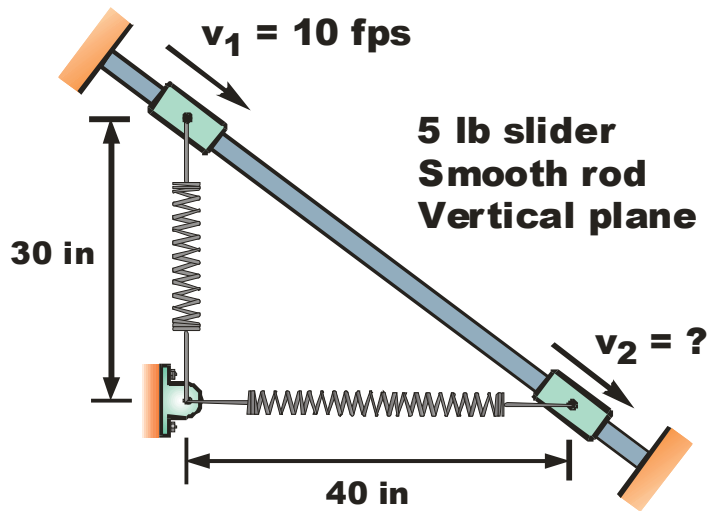
A 5 lb slider moves along a smooth rod in a vertical plane with an initial speed of 10 fps. Connected to it is a spring with a spring constant of 5 lb/ft and an unstretched length of 20 inch. When the slider reaches position 2, please determine its speed, v_2 .



Spring: $k = 5$ lb/ft

Unstretched length = $L_0 = 20$ inch

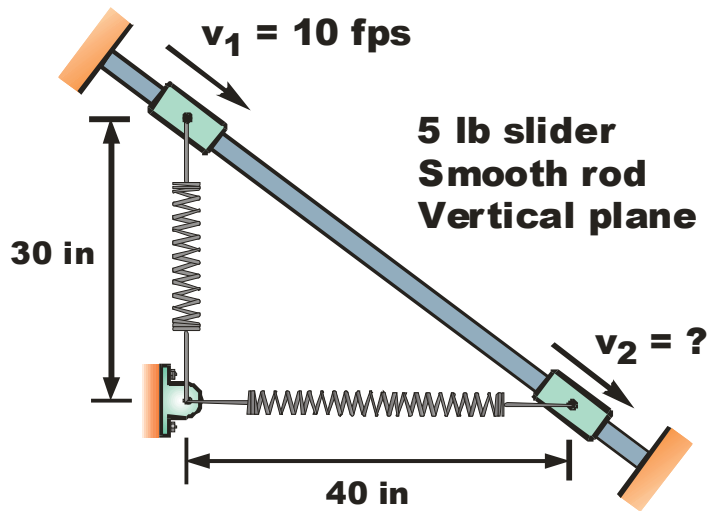
Neglect the mass of the spring.



Spring: $k = 5$ lb/ft

Unstretched length = $L_0 = 20$ inch

Neglect the mass of the spring.



5 lb slider
Smooth rod
Vertical plane

$$\frac{1}{2}mv_1^2 + mgh - \frac{1}{2}k[s_2^2 - s_1^2] = \frac{1}{2}mv_2^2$$

Spring: $k = 5$ lb/ft

Unstretched length = $L_0 = 20$ inch

Neglect the mass of the spring.