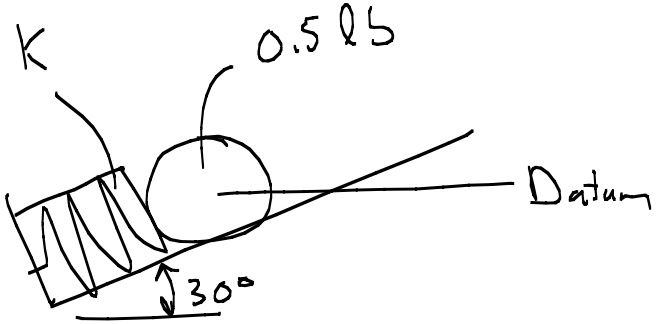
Problem 3



The spring is compressed 2in when no load is applied

Determine: the smallest stiffness, K to shoot the ball a max distance of 30in if the spring pushed back an additional 3in and is released from rest

Conservation of Energy

$$\Sigma T_1 + \Sigma V_1 = \Sigma T_2 + \Sigma V_2$$

$$0 + \frac{1}{2}k(2in + 3in)^2 = 0 + \frac{1}{2}k(2in)^2 + (0.5lb)(30in)\sin 30^\circ$$

$$\boxed{k = 0.714\ lb/in}$$