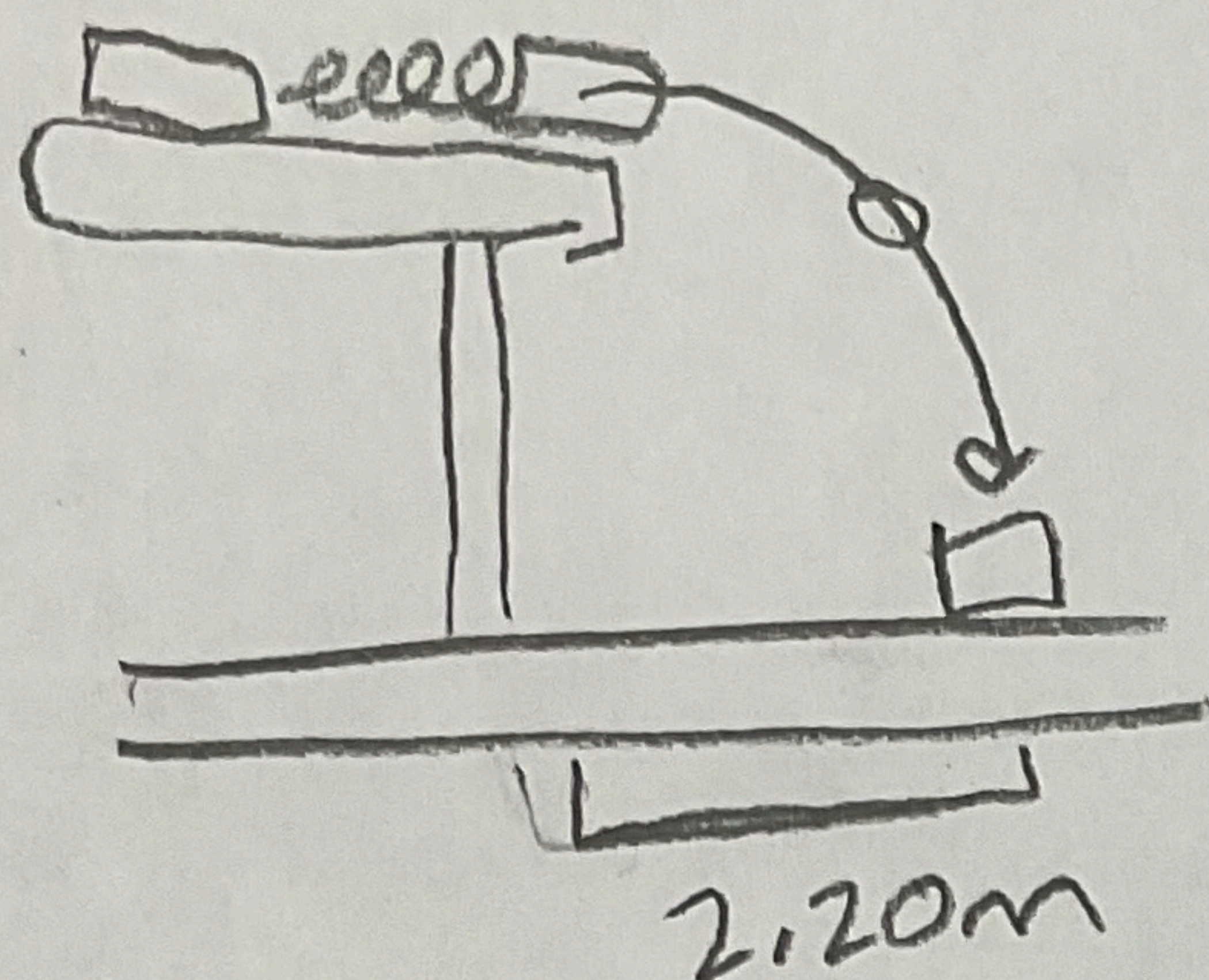Justin Arnold

4.

compresses spring 1.1cm

2.20m

marble falls 27.0cm
short of the center of
the box

- No friction

$g = 10 m/s^2$

$F = -Kx$

$w_0 = \sqrt{K/m}$

$x(t) = A \cos(wt + \phi)$

$\dfrac{27 cm}{1.1 cm} = 24.545$

$1cm = 24.545cm \rightarrow .24545m$

$\dfrac{2.2m}{.24545m} = \boxed{8.96296cm}$