1. (4 points) Define (a) work of a force on a body, (b) work of a moment on a body.

2. (6 points) The 10-kg rod shown is given a counterclockwise angular velocity of \( \omega \) in the position where \( \theta = 0 \). If the spring has a modulus of \( k = 10 \text{ kN/m} \) and the rod is stopped by the spring just when it becomes horizontal, determine the value of \( \omega \).

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1. (a) Work of a force on a body is equal to the force acting on the body times the displacement of the body in the direction of the force. (b) Work of a moment on a body is equal to the moment acting on the body times the angular displacement of the body in the direction of the moment.

2. 

\[
T_1 + V_1 = T_2 + V_2 \\
\frac{1}{2} \left[ \frac{1}{12} (10)(0.7)^2 + 10(0.35)^2 \right] \omega^2 + 10(9.81)(0.35) \\
= 0 + \frac{1}{2} (10000)(0.1)^2
\]

\( \omega = 4.3797 \quad \omega = 4.38 \text{ rad/s} \)