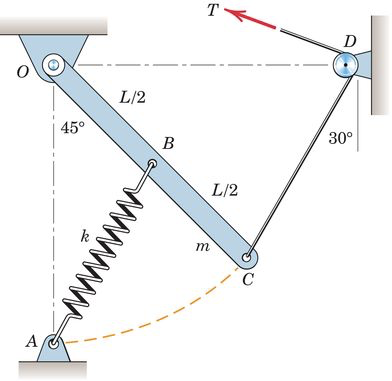
# Final Exam Problem 04: Chapter 05

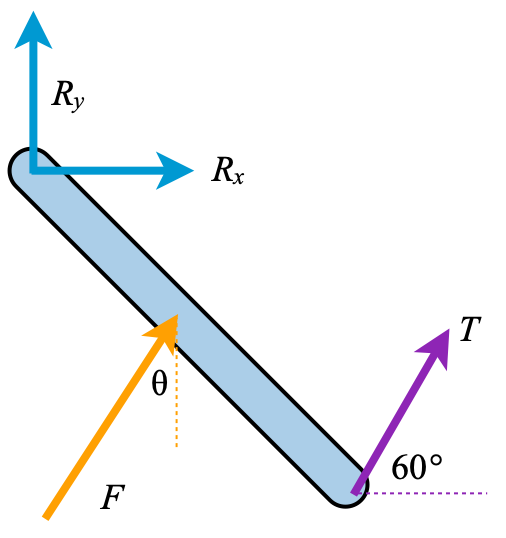
The rod shown has a length , and is pinned at its end . The attached spring has a stiffness , and an unstretched length . The spring is unstretched when .



1. Draw the free body diagram for rod . Do this carefully and pay attention to the various angles!

See free body diagram on the right!

1. Calculate the spring force by determining the stretched length of the spring in the position shown.

Use Law of Cosines on the triangle

1. Determine the tension in the cord when the system is in equilibrium at (Hint: You’ll need to solve for the spring angle !).

Use Law of Sines to find the angle

Sum the moments about the origin. Let counter-clockwise be the positive direction:

1. Determine the reaction force at point .

Sum the forces and solve the system