Physics 271, Section ... Thursday, Nov 13, 2014
Quiz #10 Equilibrium & Elasticity

Name: [**5 pts**]

1) A girl, with mass M, is singing, while standing on a ladder as shown in the fig. 1. The ladder is massless and there is no friction between the ladder and the ground. Use ladder steps as a guide to find any length you need; for example, the girl is standing on the fourth step counting from the bottom, or two third of the total length. The angle between each part of the ladder and the vertical line is θ. In the middle of the ladder there is a rope connecting two parts of the ladder together.

a) There are three external forces acting on the whole ladder as a system. Draw these forces on a diagram. [**3 pts**]
b) Write down the equilibrium conditions and find the normal forces between the floor and the ladder. [**5 pts**]
c) Now think about any one of the two parts of this ladder. Write only one equilibrium equation to find the tension force of the rope. [**2 pts**]
d) What are the forces that the ladder parts exert on each other on on the top point of the ladder? [**2 pts**]

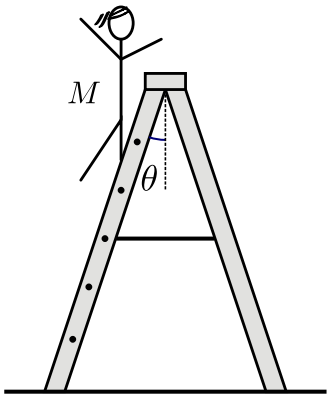

Figure 1: A girl singing on a ladder.