Name: _____

1. Define torque, and state the conditions necessary for stable equilibrium. (20 pts)

2. Why are the following equations equivalent for this experiment? (20 pts) $\tau = rF\sin\theta$ $\tau = rF$

3. Refer to the procedure, Part 1, 1st arrangement. Assume $x_{cm} = 50.0$ cm, 150.0 g is suspended from a hanger clamp at the position $x_{cc} = 15.0$ cm, and a hanger clamp is at position $x_c = 75.0$ cm. If each hanger clamp has a mass $m = 16.5$ g, what mass must be added to x_c in order to attain stable equilibrium? Sketch a diagram of the situation (refer to Fig. 8.3). (30 pts)

4. Consider Part 2 of the procedure. Determine the additional mass required for stable equilibrium. Meter stick: $x_{cm} = 50.0$ cm, $m = 150.0$ g. Hanger clamp: $x_{cc} = 0.0$ cm, $m = 16.5$ g. (30 pts)