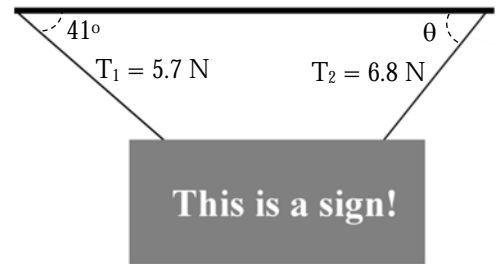


### Extra Practice Problems for Chapter 6

1. A mass hangs from two strings as shown in the diagram on the right. If the tension on the left string is 5.7 N and the tension on the right string is 6.8 N, what is the mass of the sign, and what is  $\theta$ ?



2. A box is placed on an incline with an angle of  $14.2^\circ$ . It does not slide on its own. However, when it is given a shove, it begins sliding down the ramp with a constant velocity of 0.15 m/s. What is the coefficient of kinetic friction between the box and the ramp?

3. A box is placed on an incline, and it stays at rest. The angle of the incline is increased, and it just starts to slide when the angle is  $25.4^\circ$ . What is the coefficient of static friction between the box and the ramp?

4. If the angle of incline in the ramp above is not changed and the box accelerated down the ramp at  $0.55 \text{ m/s}^2$ , what is the coefficient of kinetic friction?

5. A box is given a shove up a ramp with an angle of incline of  $33.0^\circ$ . If the coefficients of friction are 0.49 and 0.25, what is the acceleration of the box?

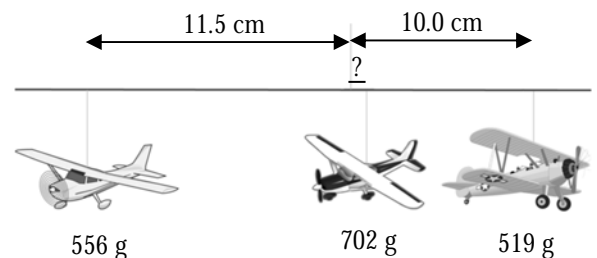
6. Two masses (257 g and 112 g) are connected by a string as shown in the diagram on the right. If the first is pulled with a force of 1.2 N, what is the acceleration of the system and the tension in the string?



7. For the same masses above, suppose the string will break if its tension rises above 2.0 N. What is the maximum magnitude of the force used to pull on the first mass if the two masses must stay connected?

8. A wheel is subjected to two forces. The first is 15.0 N, and it is perpendicular to its lever arm of 12.5 cm. The second is 11.7 N, and it is parallel to its lever arm of 16.0 cm. Is the wheel in rotational equilibrium?

9. A beam is suspended from the ceiling, and it holds two model airplanes. The first has a mass of 1.9 kg and is placed 7.2 cm right of the string that suspends the beam. If the second is placed 9.8 cm left of the string and the beam stays horizontal, what is the second model's mass?



10. Three models are hung from that same beam. Their masses and lever arms are given in the diagram on the right. What is the unknown lever arm?