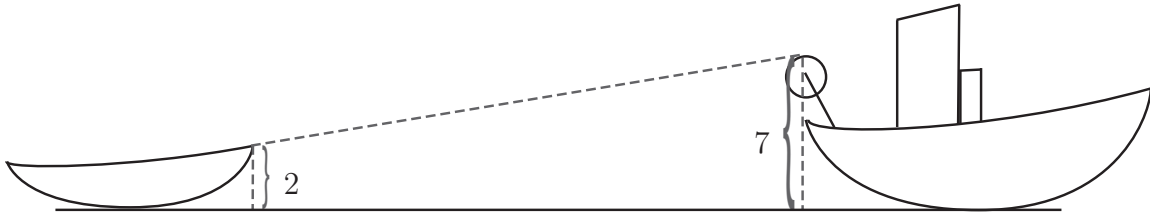


5. (10 points) A small boat has run out of gas. A cable is attached to the front of the boat 2 meters above the water. The other end of the cable is attached to a wheel of radius 0.5 meters sitting on the back of a tugboat. The top of the wheel is 7 meters above the water, and turns at a constant rate of 1 revolution per second. [See the figure below—not drawn to scale.]



- (a) At what rate is the length of the cable between the two boats changing?
- (b) How fast is the small boat being pulled forward when it is 10 meters away from the tugboat?