AP Physics Lab

Lab 7-A: *Tension in Vertical Circles*

Equipment:

- bucket of water
- 50 N spring scale
- meter stick
- stopwatch

Purpose:

- Calculate tangential velocity and centripetal force for vertical circles.

Procedures:

- Fill a bucket with approximately 2 – 4 inches of water.
- Measure the mass (or weight) of the bucket of water.
- Measure the radius of the circle.
- Swing the bucket in a vertical circle several times, measuring the total time for all circles.

Report:

1. Calculate the average tangential velocity of the bucket.

2. Using this average velocity, calculate the tension in your arm at the . . .   top of the circle.
   bottom of the circle.

   Draw a free body diagram of both situations.

3. Explain why the velocity of the bucket is not actually the same at the top and bottom of the circle.