Name: _____ Date: _____

m_r^β Physics Practice: Periodic behavior of pendulum

Another example of periodic motion is the pendulum. This lab is based on `https://phet.colorado.edu/en/simulation/pendulum-lab`. Launch the app, pause, set friction to none, earth gravity, 1/16 time, check other tools to get the stopwatch, and start the stopwatch. The stopwatch won't change, because the simulation is paused. Set mass to 1kg.

For measuring angles, let's treat angles to the right as positive, and angles to the left as negative.

1. Set the length of the pendulum to 1m, and the angle to +5 degrees.

a. What is the period T?

b. What is the frequency f?

c. What is the amplitude A?

d. Based on what you saw in the spring lab, write an equation that gives the angle θ as a function of time t. Graph in `desmos`.

e. From time 0 to time 2, at 0.25 second intervals, record (time, angle) pairs in `desmos`.

2. Change the angle to +10 degrees.

a. What is the period T?

b. What is the frequency f?

c. What is the amplitude A?

d. Write an equation that gives the angle θ as a function of time t, and graph in `desmos`.

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3. Change the length to 2m.

a. What is the period T?

b. What is the frequency f?

c. What is the amplitude A?

d. Write an equation that gives the angle θ as a function of time t, and graph in `desmos`.

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4. Does the period depend on the starting angle? Explain.

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5. Does the period depend on the length? Explain.
