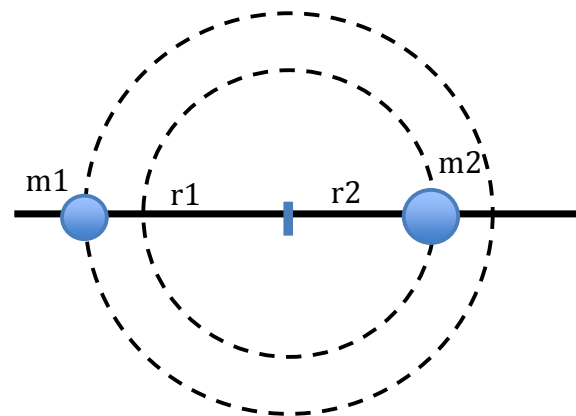


Name _____

My Solar System PhET
<http://phet.colorado.edu/en/simulation/my-solar-system>

1. The simulation shows a planet and Sun orbiting about their center of mass. The planet's orbit is circular. Let's call the initial point A. Predict how the planet's orbit will change if you change the settings, increasing the initial velocity of the planet at A.
2. Predict how the planet's orbit will change if you change the settings, decreasing the initial velocity of the planet below the value corresponding to a circular orbit at A. What part of the orbit will point A correspond to?
3. Can you find an equation for the velocity at A that results in a circular orbit?
4. What is the equation for the escape velocity of the planet? How does it compare to the velocity for a circular orbit?
5. A binary star system (like all systems) orbits its center of mass. View a simulation of this.
What is the net force on the planets' center of mass?



- a. If $v_1 = 270$ km/s, $m_1 = 6M_s$, and $T_1 = 1.70$ days, find m_2 / M_s .
Set the gravitational force on m_1 equal to the centripetal force on it. What are the unknowns in this equation? How many more equations do we need?
- b. Find more equations....