Physics 1A, Section 2

October 18, 2010
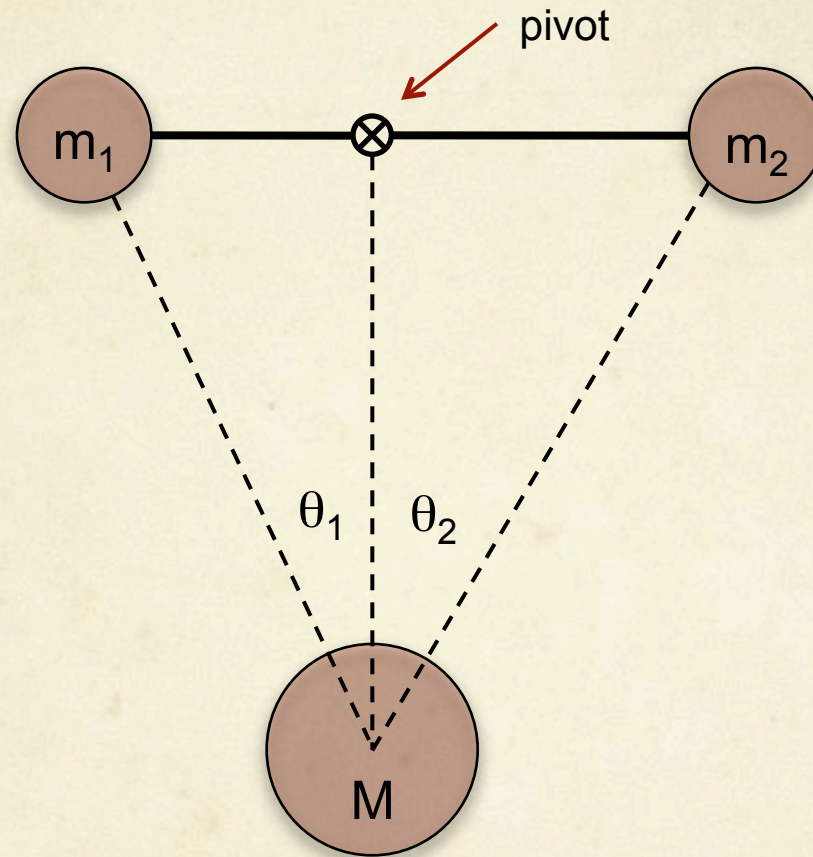
warning

- Homework problem 7.16 is difficult! Leave some time in your schedule to work on it.
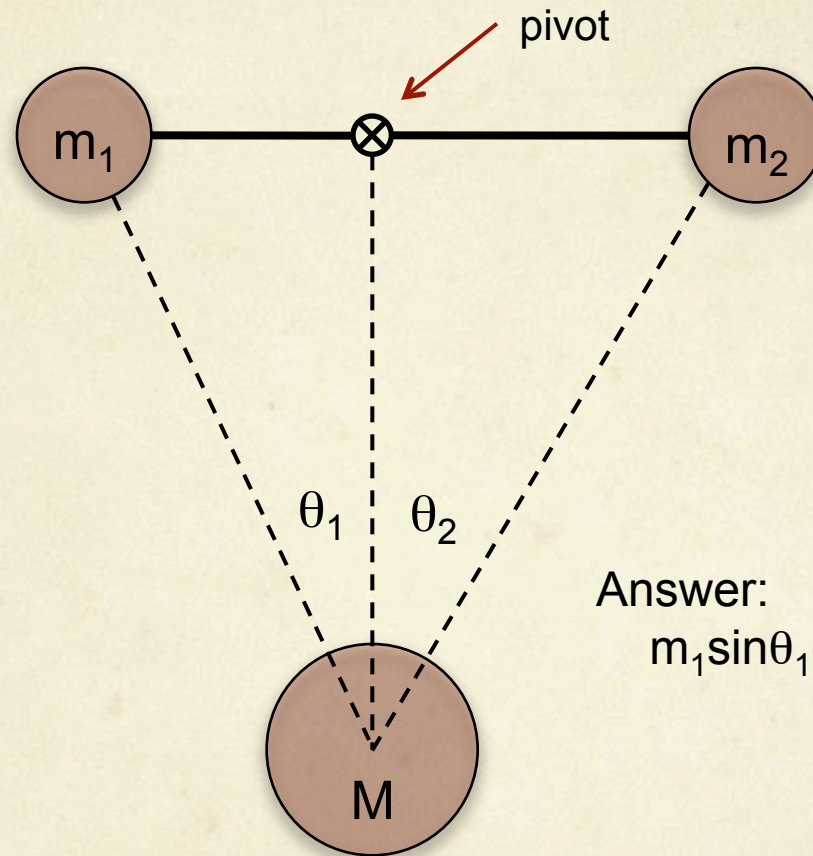
material to hit today

- statics (equilibrium) – chapters 6.5 & 6.6 in text
  - $\Sigma\, \mathbf{F} = 0$
  - $\Sigma\, \boldsymbol{\tau} = 0$
    - $\boldsymbol{\tau} = \mathbf{r} \times \mathbf{F}$

- force due to gravity

- circular motion

combined gravity & torque problem

What ratio of masses m_1 and m_2 is required to balance that system? Consider gravitational attraction of m_1 and m_2 to M, but neglect Earth's gravity.

combined gravity & torque problem

pivot

m_1
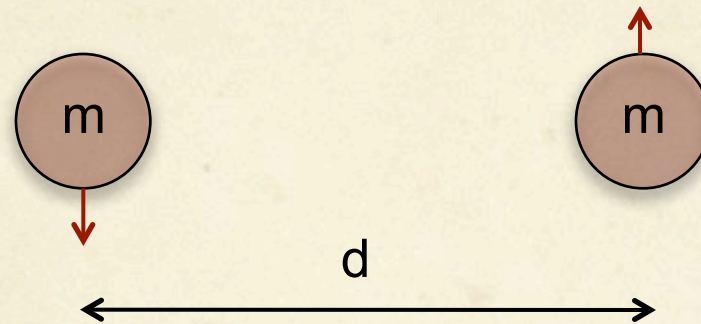
m_2

θ_1 | θ_2

M

Answer:
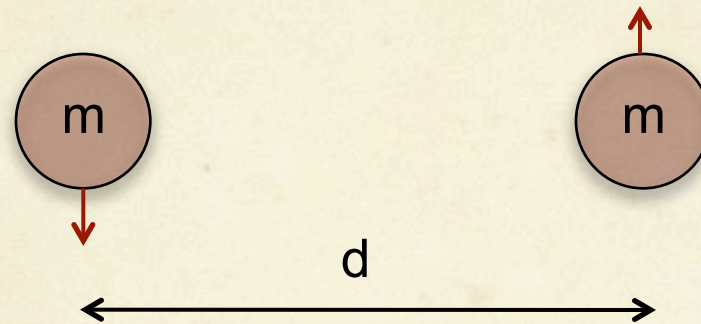$$m_1 \sin\theta_1 \cos^2\theta_1 = m_2 \sin\theta_2 \cos^2\theta_2$$

○ What ratio of masses m_1 and m_2 is required to balance that system? Consider gravitational attraction of m_1 and m_2 to M, but neglect Earth's gravity.

circular orbit

- What is the orbital period of a binary star in circular orbit with separation d, if each star has mass m?

circular orbit

m

m

d

Answer:
$$T^2 = [4\pi^2/(Gm)] \, (d^3/2)$$

○ What is the orbital period of a binary star in circular orbit with separation d, if each star has mass m?

Thursday, October 21:

- Quiz Problem 37

- ???

- *Optional, but helpful, to try these problems in advance.*