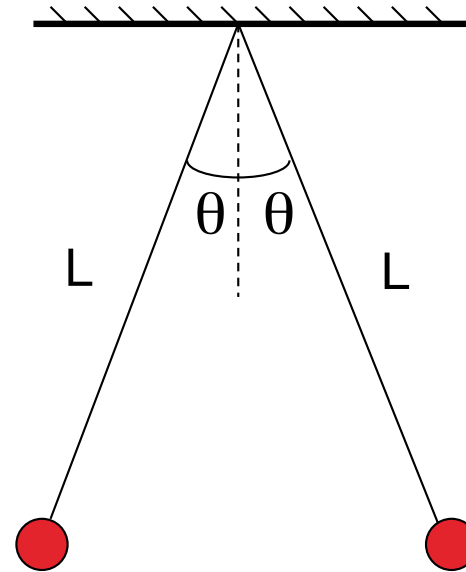
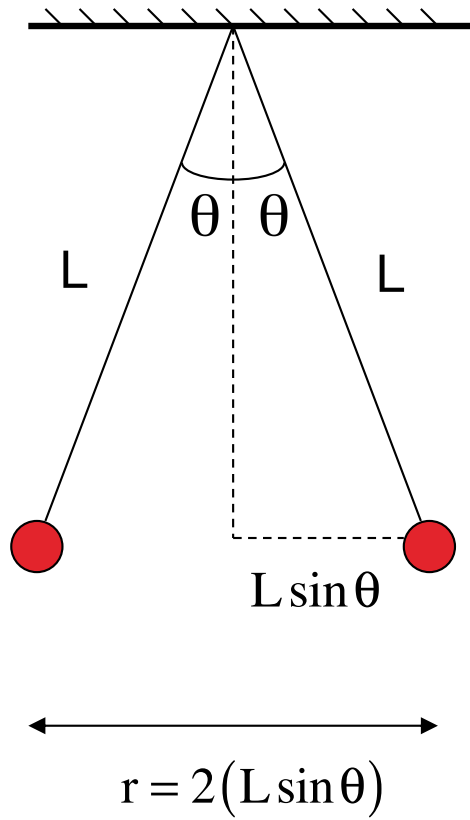


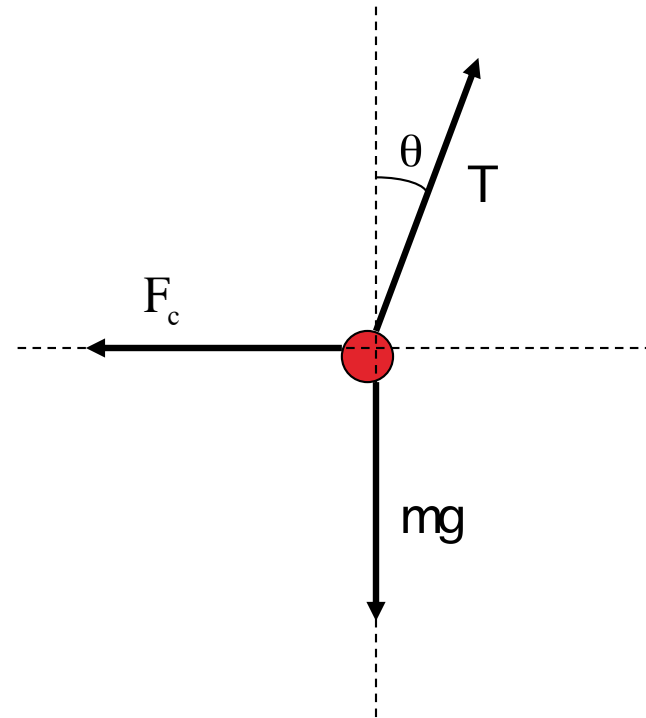
Problem 15.15

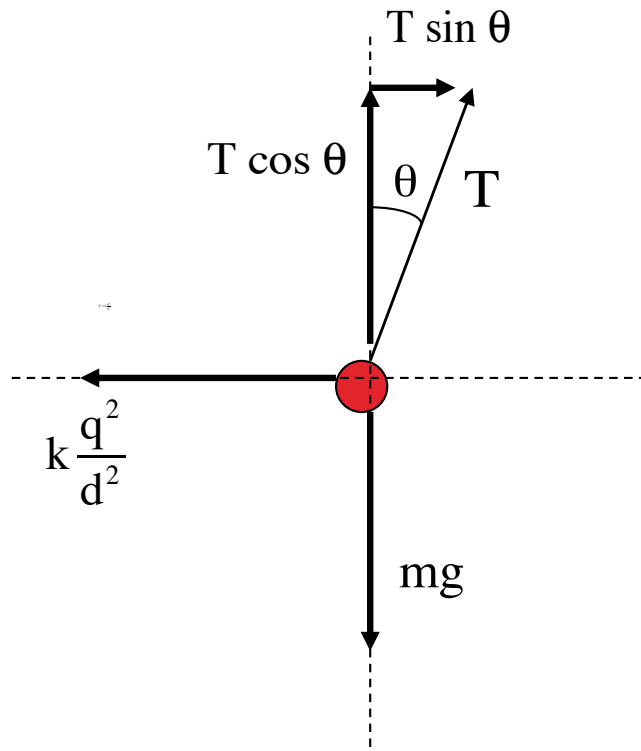
At what angle will the two balls of equal mass “ m ” be if the charge on each mass is “ q .”





f.b.d.





$$\underline{\sum F_x:}$$

$$-k \frac{q^2}{d^2} + T \sin \theta = m a = 0$$

$$\Rightarrow k \frac{q^2}{d^2} = T \sin \theta$$

$$\Rightarrow q = \sqrt{\frac{T d^2 \sin \theta}{k}}$$

$$\underline{\sum F_y:}$$

$$T \cos \theta - mg = m a = 0$$

$$\Rightarrow T = \frac{mg}{\cos \theta}$$

$$\Rightarrow q = \sqrt{\frac{T d^2 \sin \theta}{k}}$$

$$= \sqrt{\frac{\left(\frac{mg}{\cos \theta}\right) d^2 \sin \theta}{k}}$$

$$= \sqrt{\frac{mg d^2 \tan \theta}{k}}$$