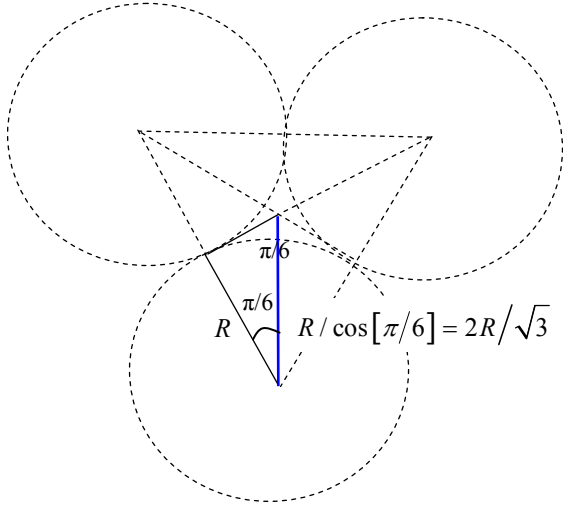


**Feynman's Tips on Physics Exercise 1-6**  
(virtual work solution notes)

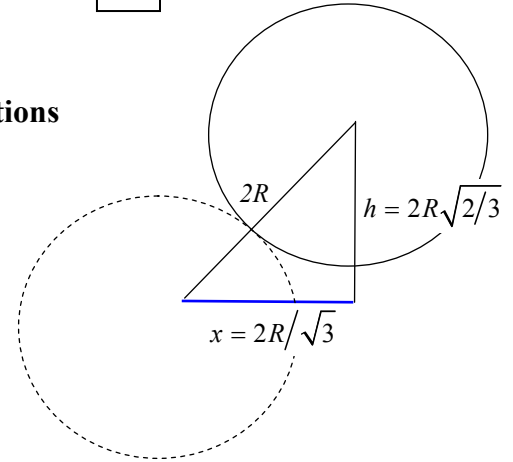
$R = \text{radius of sphere}$     $W = \text{weight of sphere} = 2\sqrt{6}$  ton-wt    $T = \text{weld tension}$

I

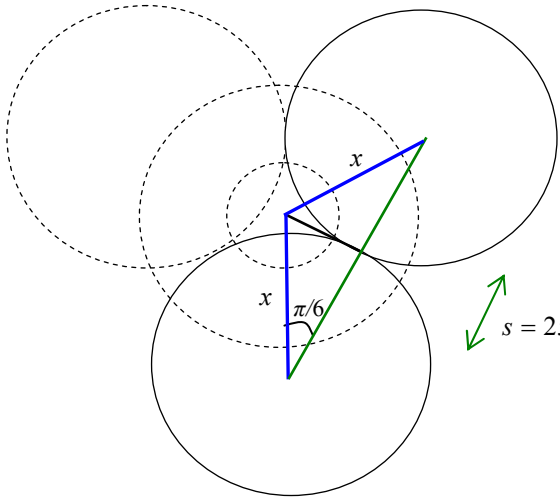


II

**Initial Positions**

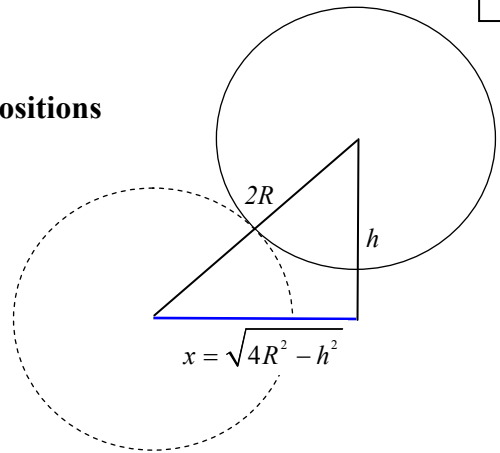


IV



III

**General Positions**



$$s = 2x \cos[\pi/6] = x\sqrt{3}$$

$$s = \sqrt{3}\sqrt{4R^2 - h^2}$$

$$\frac{ds}{dh} = -\frac{h\sqrt{3}}{\sqrt{4R^2 - h^2}}$$

$$Tds = Wdh \Rightarrow T = W / (ds / dh)$$

$$T = -\frac{W\sqrt{4R^2 - h^2}}{h\sqrt{3}}$$

$$\therefore \text{ when } h = 2R\sqrt{2/3}, \quad |T| = \frac{2\sqrt{6} \text{ ton-wt } \sqrt{1/3}}{\sqrt{2/3}\sqrt{3}} = 2 \text{ ton-wt.}$$