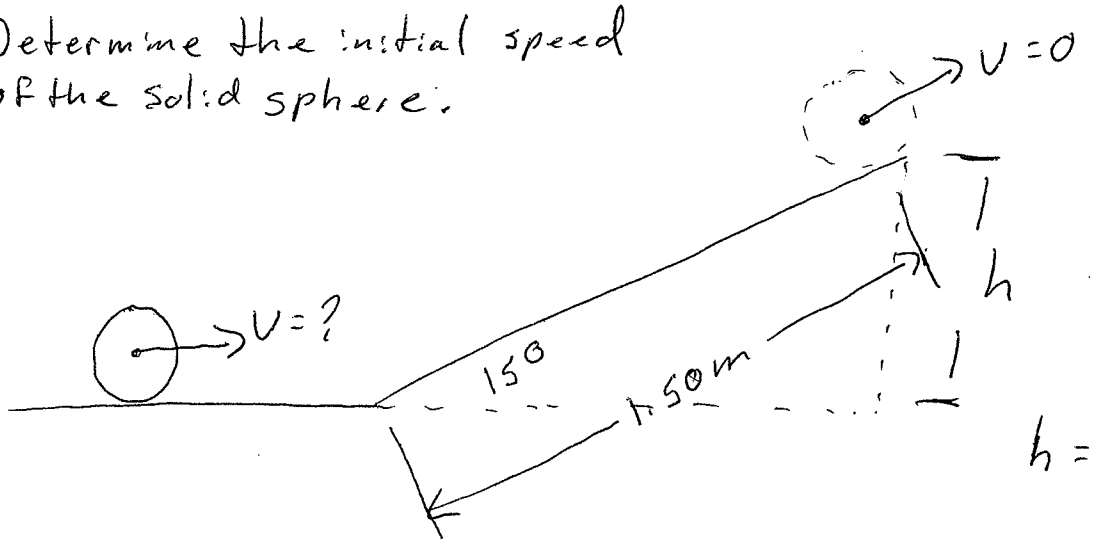
80 Determine the initial speed of the solid sphere.



$h = 1.50\text{m}(\sin 15^\circ)$

$$E_K = \frac{1}{2}mv^2 + \frac{1}{2}I\omega^2 \qquad \omega = \frac{v}{r}$$

$$= \frac{1}{2}mv^2 + \frac{1}{2}\left(\frac{2}{5}\right)m\cancel{r^2}\left(\frac{v^2}{\cancel{r^2}}\right) \qquad I = \frac{2}{5}mr^2$$

$$= \frac{1}{2}mv^2 + \frac{1}{5}mv^2$$

$$= \frac{7}{10}mv^2$$

$$E_g = mgh$$

$$\frac{7}{10}\cancel{m}v^2 = \cancel{m}gh$$

$$v = \sqrt{\frac{10gh}{7}} = \sqrt{\frac{10\left(9.81\text{m/s}^2\right)1.50\text{m}\left(\sin 15^\circ\right)}{7}} = \boxed{2.33\frac{\text{m}}{\text{s}}}$$