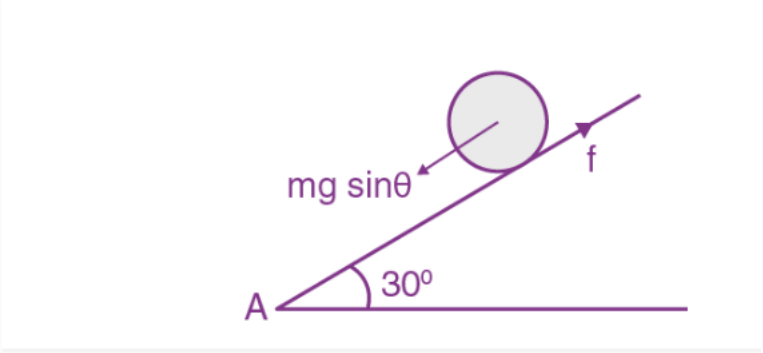
Question 2) A solid sphere of mass 2 kg radius 0.5m is rolling with an initial speed of 1 ms^{-1} goes up an inclined plane which makes an angle of 300 with the horizontal plane, without slipping. How long will the sphere take to return to the starting point A?



$a = \frac{gsin\theta}{1+c}$

For a solid sphere, c = ⅔

$a = \frac{9.8sin30^0}{1+\frac{2}{5}}$

a = 3.5 m/sec^2

Time of ascent is given by

v = u + at

0 = 1 – 3.5 t

$t = \frac{1}{3.5} sec$

Time of decent

$t = \frac{1}{3.5} sec$
(due to symmetry of motion)

Total time,

$T = \frac{2}{3.5} sec$
= 0.57 sec