

**Quiz #5**  
Dynamics

Name (LAST, First)

**GIVEN:** A particle of mass  $m$  starts its motion on the inside surface of a smooth conical shell with initial velocity  $\underline{v}_0$  tangent to the shell's horizontal rim (Point  $A$ ). At Point  $B$ , distance  $z$  below the rim, the velocity is  $\underline{v}$  (speed  $v$  with direction angle  $\theta$  below the horizontal).

The known quantities are:  $v_0, R, h, z$ .

**REQ'D:** Determine expressions for the speed  $v$  and angle  $\theta$ .

*Hints:* What forces act on particle? A top-view of the cone might be useful.

