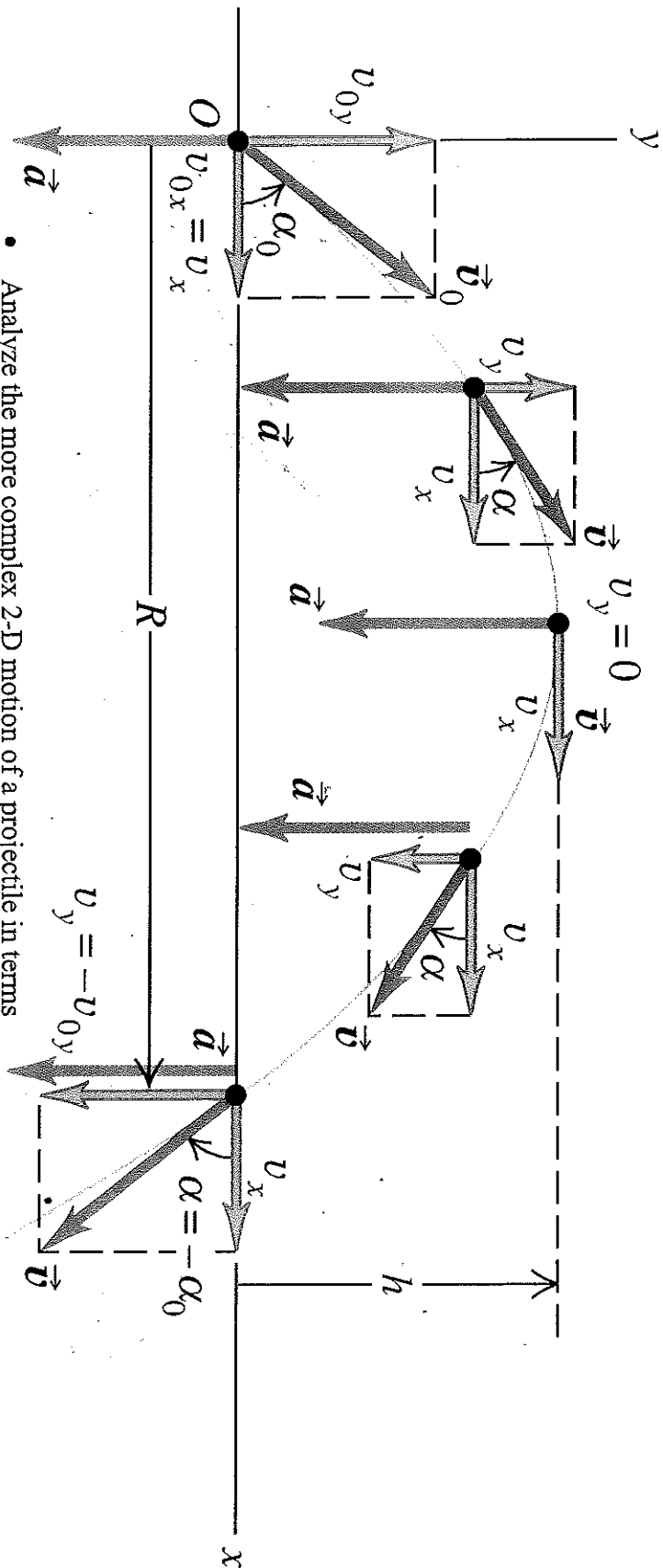


Figure 3-15 Projectile motion



- Analyze the more complex 2-D motion of a projectile in terms of two independent linear motions; x-horizontal and y-vertical.
- The instantaneous velocity of a projectile is always directed tangent to its trajectory path.
- If air resistance is neglected,  $a_x=0$  and  $a_y=g$ . \* Since  $a_x=0$ ,  $v_x$  is constant. Vertically, the projectile exhibits free-fall motion. Horizontally, the projectile exhibits uniform velocity.
- A projectile's height is determined by the y-component of its initial velocity. A projectile's range is determined by the x-component of its initial velocity.
- The horizontal and vertical times for a projectile to reach a certain point along its trajectory are identical.

