Answer on Question 49941, Physics, Mechanics — Kinematics — Dynamics The particle is projected with a velocity of 30 m/s at an angle 40 above a horizontal plane. Find 1) the time for which the particle is in the air 2) the horizontal distance it travels Solution

Vertical initial speed is

$$v_{y0} = v_0 \sin \alpha = 30 \cdot \sin 40^\circ \approx 19.3 \, m/s$$

Let us find time for which the particle is in the air. It is twice of the tame it takes particle to reach highest point. Hence

$$t_t = 2t_h = 2\frac{v}{q} = 2\frac{19.3}{9.8} \approx 3.9\,s$$

Now we can find horizontal distance. It is equal to total time  $t_t$  times horizontal velocity

$$l = v_{x0}t_t = v_0 \cos \alpha \cdot t_t = 30 \cdot \sin 40^\circ \cdot 3.9 \approx 90 \, m$$

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