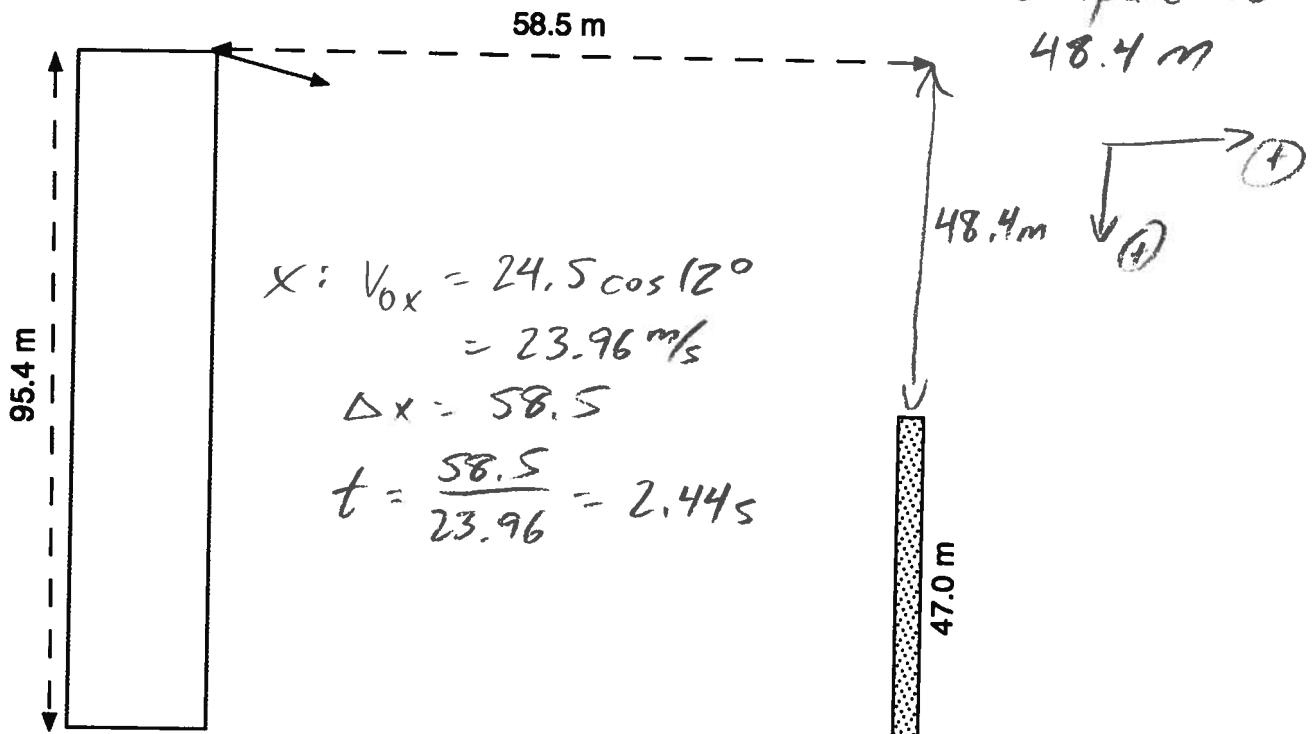


Physics 10154 - Quiz 3D

A ball is thrown from the roof of a 95.4 meter tall building with an initial velocity of 24.5 m/s directed 12.0° below the horizontal. 58.5 meters away horizontally from the building is a wall that is 47.0 meters high.

Does the ball clear the wall? If yes, by how much? If no, how far below the top of the wall does the ball hit the wall?



$$y: \Delta y = ?$$

$$v_{0y} = 24.5 \sin 12^\circ = 5.094$$

$$v_y = ?$$

$$a_y = 9.8$$

$$t = 2.44 \text{ s}$$

$$\Delta y = (5.094)(2.44) + \frac{1}{2}(9.8)(2.44)^2$$

$$= 12.42 + 29.17$$

$$= 41.59 \text{ m}$$

$$\text{Final altitude of ball: } 95.4 - 41.59 = 53.8 \text{ m}$$

$$\boxed{\text{Ball clears wall by } 53.8 - 47.0 = 6.8 \text{ m}}$$