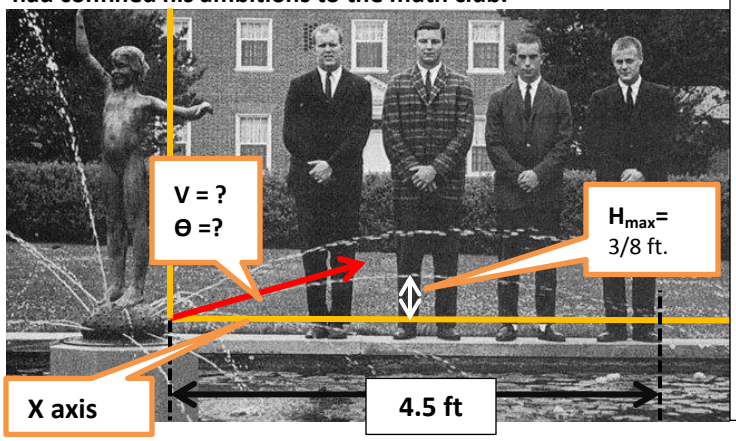
PROJECTILES

Units 9 mostly & Kinematics Dr. John P. Cise, Professor of Physics, Austin Community College, 1212 Rio Grande St., Austin Tx 78701 jpcise@austincc.edu & NYTimes January 27,2013 by Michael Barbaro

$1.1 Billion in Thanks From Bloomberg to Johns Hopkins

Mayor Michael R. Bloomberg, on the Johns Hopkins campus this month, is the most generous living donor to any education institution in the United States, according to university officials and philanthropic tallies.

BALTIMORE — He arrived on campus a middling high school student from Medford, Mass., who had settled for C's and had confined his ambitions to the math club.



INTRODUCTION: **The lower parabolic water jet in graphic below left reaches a maximum height of 3/8 ft. The water Jet from the fountain travels 4.5 ft. in X direction.**

QUESTIONS: **(a) Know the vertical motion of a projectile is the same as a freely falling object, find time(t) it takes the water jet to rise to it's maximum height and then return to the horizontal X axis? (b) Find initial velocity V of water jet from fountain and angle (Θ) it was projected at?**

HINTS: **As you can see three unknowns exist: t,v, & Θ. Thus, three equations need to be set up from available physics concepts on projectile motion. The key concepts are: (1) The vertical motion of a projectile is the same as any freely falling object. (2) The horizontal component of velocity remains the same for the entire projectiles flight. (3) The time for the projectile to move horizontally is the same time as it takes to move vertically. Remember to take the origin (0, 0) to be at the start of the projectile motion. Always find the horizontal and vertical components of velocity. To solve efficiently, break you solution into vertical and horizontal parts. In this way you will keep the accelerated motion vertically separate from the horizontal motion which has no acceleration. Some useful kinematic equations:** $x = v_o t + (1/2)at^2$, $x = v_{average}\, t$
Also, $\sin\Theta/\cos\Theta = \tan\Theta$, $g = 32\ ft/s^2$

ANSWERS: **(a) t = 0.306 s , (b)** $\Theta = 18.4^o$ **, v = 15.5 ft/s**

Who's the top donor? Third from the left. The other 1964 Johns Hopkins class officers were Jim Kelly, Al Bigley and Larry Alessi.

But by the time Michael R. Bloomberg left Johns Hopkins University, with a smattering of A's and a lust for leadership, he was a social and political star — the president of his fraternity, his senior class and the council overseeing Greek life. "An all-around big man on campus," as he puts it. His gratitude toward the university, starting with a $5 donation the year after he graduated, has since taken on a supersize, Bloombergian scale.

On Sunday, as he makes a $350 million gift to his alma mater — by far the largest in its history — the New York City mayor, along with the president of the university, will disclose the staggering sum of **his donations to Johns Hopkins over the past four decades: $1.1 billion.** That figure, kept quiet even as it transformed every corner of the university, makes **Mr. Bloomberg the most generous living donor to any education institution in the United States**, according to university officials and philanthropic tallies. The **mayor, who is 70, has pledged to give away all of his $25 billion fortune before he dies,** and he has built up a foundation on the Upper East Side of Manhattan to carry out the task.