DUTCHESS
COMMUNITY COLLEGE

Final Project: Physics Illustrated in "Hancock"

PHY121

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Unit 1

Scene Analysis

Duration: 25:40 - 27:55

Summary:

On the first day of trying to reform his public image, the superhero Hancock loses his temper to a 10 year old child and throws them a couple hundred meters into the air. After a couple seconds, Hancock catches them right before they touch the ground.

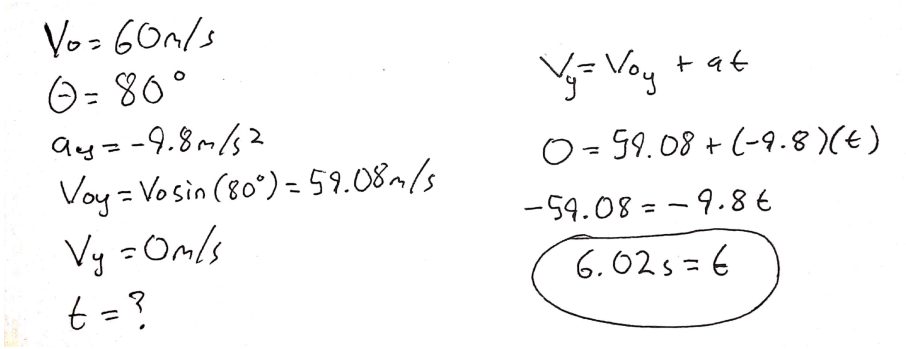
Concepts Demonstrated

I think this scene covers many aspects of *kinematics* well, including *projectile motion*, *acceleration due to gravity*, and *free falling bodies*.

Problem 1

If Hancock throws the child at an angle of 80° and an initial velocity of 60 m/s, how long does it take for the child to reach their maximum height in the air?

Solution:



Problem 2

Using the answer you got from Problem 1, calculate how far Hancock will have to walk to catch the child and avoid a longer jail sentence.

Solution:

$V_0 = 60 m/s$

$\theta = 80^\circ$

$a_x = 0 m/s^2$

$V_{ox} = 60\cos(80^\circ) = 10.42 m/s$

$t = 6.02 \cdot 2 = 12.04 s$

$dx = ?$

$dx = V_{ox} t$

$= (10.42)(12.04)$

$dx = 125.45 m$