Open Ended Problem #3
The Little Rascals
INDIVIDUAL WORK ONLY, Due 9/25/24 at beginning of class
(Don't be afraid to "Google" good assumptions!)

The Little Rascals Clip

I can't even begin to describe the amazing technologies that exist in this world to make this scene possible. However, I'll be a good movie watcher and suspend my disbelief. You, however, need to do some calculating. Based upon the angle and location of the hose, how much water must be flowing through the hose to lift Spanky in the air at the speed seen in the movie?

1) What is this problem actually asking for? (Be specific, and answer in terms of things you can actually solve for!)

2) Draw a sketch depicting the conditions of interest, including the actual pipe layout.

3) a) What physical laws apply to this problem?
b) Indicate equations, correlations, and/or formulae that can model these laws.
c) What are the potential limitations of these equations?

4) What assumptions should be made?
a) List ALL the assumptions that you need to in order to solve the problem.
b) Justify your assumptions (references, reasoning, judgment, common sense, etc. where possible, use numbers and ***quick*** calculations)

5) What are the physical properties you used in this problem?

6) Calculate the quantity that you listed in part 1 (be sure to include intermediate values).

7) Verify your answer... Does it look reasonable? Anything odd about the calculation?

a) What would need to happen to the water flow to justify Spanky stopping his upward motion (quantify this… don't just say less or more). Why is this strange?

b) What direction should the hose be pointed (at the calculated mass flow rate from 6) in order to produce the hose/Spanky movements seen in the movie (smooth side movement, etc.)? Do the hose's movements reflect this (i.e. is the movie's hose movement realistic)?

c) How much water do the Rascals use to put out the fire, assuming that they sprayed constantly for 20 minutes?