WITHOUT A PADDLE
How to tell the difference between
Galileo's *Principle of Relativity* (c: 1632)
and toxic sewage.*

Physics 203, Fall 2017
John Jay College of Criminal Justice, the CUNY
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I. **Cum Laude (~ +3 points on MidTerm 2)**

II. **Magna Cum Laude (+3 points on Final Semester Average**

For 3 extra credit points to be added to your raw score on the next Mid-Term exam, you must submit a clear, complete, honest, articulate and mathematically supported solution to the kinematics problem reprinted on the following page (Gamow, 2012).

Given the highly particular character of this assignment, the actual content and thoughtfulness of your solution will be treated with close consideration. You are highly encouraged, if not personally challenged and academically obligated, to attack the assignment with corresponding seriousness. +3 points is an expectation value; it is not a maximum. Sufficient levels of thoroughness, authenticity and nuance stand to earn more than the expected 3 points.

NOTE WELL:

You might not be interested in nor motivated by extra credit. Perfectly respectable. Completion assignment, nonetheless, is mandatory. The description 'extra credit' refers to the very real fact of numerical reward (above and beyond the arithmetic mean computed to measure your fundamental grip of course material and/or basic fulfillment of course requirements). For your nimble stepping up to the spontaneous emergence of this assignment, you have been promised and you will receive such reward.

You are welcome to a less cheerful interpretation of the assignment or its surrounding context. You are welcome to dismiss and/or critique any class-dynamical implications of which you might suspect this assignment to be culpable.

You are not welcome, however, to neglect, skip, reject, ignore, falsify or take a pass on this assignment. It is required. At the instructor's discretion, according to the syllabus, points can be deducted for any or every zero recorded in association with an un-submitted hw assignment. Please assume such discretion will be exercised in this case.

A man in a boat travels along a river. The river has a 'current': It flows past the shore at a constant speed. The man travels 'upstream': against the current.

Relative to water, the boat speed is constant (fig. below). There is a whisky bottle on the boat. At the instant the boat passes under a bridge, the bottle falls into the water.

For 20 minutes, the boat continues upstream at a constant speed. The bottle floats downstream. At the end of 20 minutes, the man reverses the boat (smoothly and quickly; a negligible time interval elapses during turnaround).
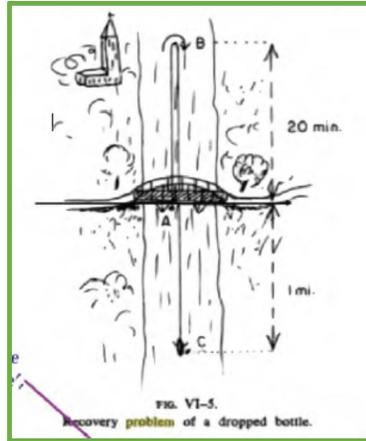
FIG. VI–5.
Recovery problem of a dropped bottle.

The man heads downstream. Just like it was upstream, the speed of the boat relative to the water is constant. Relative to water, the downstream speed of the boat turns out to be twice as fast as was the upstream speed.

A mile below the bridge, the boat picks up the bottle.

The Question:
Relative to shore, what is the constant speed at which this water flows
(i.e.: how fast is the 'current')?

III. Summa Cum Laude (Approx. +6 points on Final Semester Average)

At the links below, you will find various endeavors to illustrate, model or simulate subtle implications of the problem and its solution. These attempts may or may not speak to you, but each project was initiated and completed by a john Jay physics student upon working through some sort of realization about time and space.

For a truly substantial bump on your final average, use these examples as inspiration and really do something with this problem. You know the difference between really real and adequate. But feel free to discuss with me any proposal you might have.

https://www.youtube.com/watch?v=I8qoW5Rakow&index=6&list=PLxnKB0sga7aDvOiGHx6gKzXtXU6bm6xdc

https://www.youtube.com/watch?v=3I0CrIkEeXI&list=PLxnKB0sga7aDvOiGHx6gKzXtXU6bm6xdc&index=21

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Gamov, G., *The Great Physicists from Galileo to Einstein* (New York, NY: Dover Publications, 2012).