*** TRAIN of THOUGHT ***
PHYSICS 203, Prof. Daniel A. Martens YAVERBAUM
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1. The Train Itself

It is late on an exhausting school night. You wake up to find yourself sitting in the car of a sleek and modern express subway train. The train signs indicate that it is a south-bound train. Its intended destination is downtown: 14th Street. You are no longer at John Jay College's uptown address; you are somewhere between 59th Street and 14th Street.

Inside the train, everything looks symmetric (the same, in a certain way). That is, seats face north, south, east and west; windows are arranged identically on all walls; neither the floor nor the ceiling is marked by any distinguishing features. You neither feel nor hear anything: no bumps, no lurches, no turns. None of your senses experience anything to indicate instability nor change. You do recognize that the train design seems quite technologically up-to-date.

The question is:

ARE YOU MOVING ? (!)

Note: Right now, interpret this question to signify whatever you find most reasonable and helpful; take the words to mean whatever allows you to think of an answer you could most confidently and thoroughly defend. You might not believe your answer to be 100% accurate, nor even close. That's FINE.

1A) Draw a neat and clear sketch of the situation as you understand it.

NOTE: This instruction might seem annoyingly vague and open-ended. (It is.) To FOCUS your sketching,

(i) MAKE A LIST of all features that might be **HELPFUL** for answering the **QUESTION** above.

(ii) ORDER your list by **SIZE:** Rank items or features that should somehow appear larger in your sketch stoward the top, and vice versa.

(iii) NOW DRAW. Fuss more about whether the items in your drawing are recognizable for what you mean them to be; fuss less about cosmic beauty.

The ideal sketch: Will include many of the features in your list and not much else.

From the five choices provided, choose the one that you believe is the most accurate response to each of the following questions:

1B) At this moment, are you moving?

    a. Yes
    b. No
    c. Both yes and no
    d. Neither yes nor no
    e. Not enough information to choose any of the above

1C) At this moment, are you getting closer to 14th Street?

    a. Yes
    b. No
    c. Both yes and no
    d. Neither yes nor no
    e. Not enough information to choose any of the above

1D) At this moment, is 14th Street getting closer to you?

    a. Yes
    b. No
    c. Both yes and no
    d. Neither yes nor no
    e. Not enough information to choose any of the above

1E) In a few complete sentences of English, defend your answer to the very first question -- 1B (above).

1F) In a few complete sentences, provide an argument or explanation as to why a reasonable might *disagree* with your answer to the very first question --1B (above).

1G) Were your answers for 1C and 1D (both above) the same or different? If the same, then in a complete sentence or two, explain why they were the same. If different, then, in a complete sentence or two, explain why they were different.

2. The White Lights

Some time later, you look through an arbitrary window and see a slew of tiny white lights rushing by. All the lights appear to move as one group. That is, they all appear to move at one speed and in one direction. You are just looking out the window for the first time, so you do know when, if ever, the lights had begun to behave in this manner.

2A) Draw a neat and clear sketch of what you see through the window. Use arrows of thoughtfully chosen sizes and directions to indicate any motion you observe.

Of the five given choices, choose the one that you believe is the most accurate response to each of the following questions:

2B) At this moment, are you moving?

a. Yes
b. No
c. Both yes and no
d. Neither yes nor no
e. Not enough information to choose any of the above

2C) At this moment, are you getting closer to 14th Street?

a. Yes
b. No
c. Both yes and no
d. Neither yes nor no
e. Not enough information to choose any of the above

2D) At this moment, is 14th Street getting closer to you?

a. Yes
b. No
c. Both yes and no
d. Neither yes nor no
e. Not enough information to choose any of the above

2E) At this moment, is the train getting closer to John Jay College?

     a. Yes
     b. No
     c. Both yes and no
     d. Neither yes nor no
     e. Not enough information to choose any of the above

2F) At this moment, is John Jay College getting closer to the train?

     a. Yes
     b. No
     c. Both yes and no
     d. Neither yes nor no
     e. Not enough information to choose any of the above

2G) In a few complete sentences of English, defend your answer to question 2B (above).

2H) In a few complete sentences, provide an argument or explanation as to why a reasonable might *disagree* with your answer to 2B (above).

Of the five given choices, choose the one that you believe is the most accurate response to each of the following questions:

2I) At this moment, are the lights moving?

     a. Yes
     b. No
     c. Both yes and no
     d. Neither yes nor no
     e. Not enough information to choose any of the above

2J) At this moment, is 14th Street getting closer to the lights?

    a. Yes
    b. No
    c. Both yes and no
    d. Neither yes nor no
    e. Not enough information to choose any of the above

2K) At this moment, are you getting closer to the lights?

    a. Yes
    b. No
    c. Both yes and no
    d. Neither yes nor no
    e. Not enough information to choose any of the above

2L) At this moment, are the lights getting closer to 14th Street?

    a. Yes
    b. No
    c. Both yes and no
    d. Neither yes nor no
    e. Not enough information

2M) At this moment, are the lights getting closer to you?

    a. Yes
    b. No
    c. Both yes and no
    d. Neither yes nor no
    e. Not enough information

2N) In a few complete sentences of English, defend your answer to question 2**M** (above).

2O) In a few complete sentences, provide an argument or explanation as to why a reasonable might *disagree* with your answer to 2**M** (above).