Logic, Reasoning, and Persuasion 07; Deductive Reasoning Midterm
Monday, October 20th, 2025. 100 points (20 questions, 5 points per question). Closed book, one sheet (double-sided) of notes allowed. No other resources allowed. ***Please write answers in the Blue Book!***

Practice Midterm Solutions

1 | Statements and Arguments (60 points)

1.1 | Statements (15 points)

For each of the following, identify (a) whether it is a statement, and (b) if you said "yes" to statement, whether or not it is **simple**. You may give a brief explanation of your reasoning, but you don't have to.

1. The tallest mountain in the world is the Chrysler building.
   This **is** a statement, and it is simple.
2. The Mariana Trench: the deepest place on Earth.
   This is **not** a statement. You would need to replace the colon with an "is."
3. You should not enter the experience machine if you would not be truly experiencing your real life.
   This **is** a statement. And it is *not* simple: you could break it up into the following simple statements: "You should not enter the experience" and "you would not be truly experiencing your real life."

1.2 | Truth-Preservation (15 points)

Determine whether each of these arguments is truth-preserving:
Remember, to check if an argument is truth preserving, you *suppose* the premises are true and see if the conclusion *must* be true.

1. First Argument:
   P1 If voter-ID laws are strict rather than lax, there will be no voter fraud.
   P2 Right now, voter-ID laws are lax.
   C So there will be voter fraud.
   This is **not** truth-preserving: it could be that *whether or not* voter-ID laws are strict, there will be no voter fraud. So it could be that there is no voter fraud even though voter-ID laws are lax.
2. Second Argument:
   P1 Flight delays increased after the Government shut down.
   C Therefore, the Government shut down caused the flight delays.
   This is **not** truth-preserving: even if the flight delays increased after the govenmernt shutdown, they may not have been *caused* by the shutdown.
3. Third Argument:
   P1 No unicorns have horns.
   P1 Bob has a horn.
   C So Bob is not a unicorn.
   This **is** truth-preserving. If no unicorns have horns, the if something has a horn, it must not be a unicorn. Since Bob doesn't have a horn, he must not be a unicorn.

1.3 | Missing Premises (15 points)

For each of these, supply a missing premise that would make the argument more complete:

1. Philosophers like Hidden Grounds, so Adrian likes Hidden Grounds.
   Adrian is a philosopher.
2. The ground is probably wet right now, since the ground usually gets wet when it rains.
   It is raining right now.
3. Workers at A2Z Corp could always quit and find a different job, so nobody should complain about poor working conditions at A2Z Corp.
   If you could quit and find a different job, then you shouldn't complain about working conditions in your job.

1.4 | Deductive and Inductive Arguments (15 points)

Recall that an argument is **deductive/truth-preserving** if whenever the premises are true, the conclusion is guaranteed to be true, and an argument is **inductive/probability-raising** if whenever the premises are true, the conclusion is *more likely* to be true.

Identify if each is the following arguments is intended to be deductive or inductive:

1. I'm in New Brunswick, and New Brunswick is in New Jersey, so I'm in New Jersey.
   Deductive.
2. Nothing is bigger than the universe, and a mouse is bigger than nothing, so a mouse is bigger than the universe.
   Deductive (but bad).
3. The fact that I wouldn't push someone onto the train tracks in order to save five other people means I value something other than just the number of lives saved.
   Inductive.

2 | Argument Mapping (40 points)

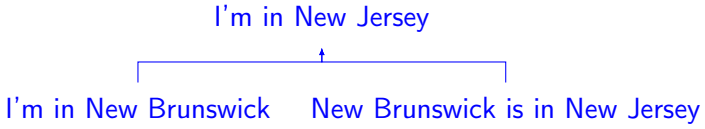
2.1 | Simplifying Statements (15 points)

The following are complex statements. For each,

1. Split up the statement, rephrasing if needed, until it is some number of smaller, simple statements.
2. Draw the support relations of the statements, where applicable.

Questions (5 points each)

1. I'm in New Brunswick, and New Brunswick is in New Jersey, so I'm in New Jersey.



2. The fact that I wouldn't push someone onto the train tracks in order to save five other people means I value something other than just the number of lives saved.

I value something other than just the number of lives saved

↑

I wouldn't push someone onto the train tracks in order to save five other people

3. I value something other than just the number of lives saved, so I wouldn't push someone onto the train tracks in order to save five other people.

I wouldn't push someone onto the train tracks in order to save five other people

↑

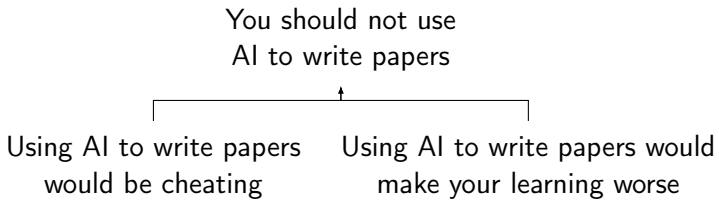
I value something other than just the number of lives saved

2.2 | Mistakes in Argument Mapping (15 points)

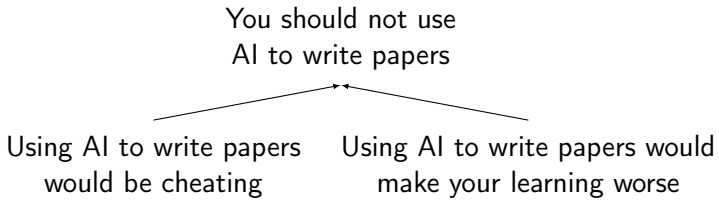
For each box (A, B, C), identify the option in the box that gives the most correct argument (the other ones makes mistakes about argument mapping).

A

Option 1:



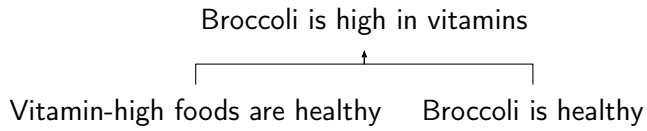
Option 2:



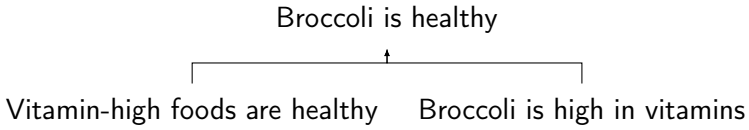
Option 2 is correct: these are two different arguments for the same conclusion. Each premise supports the conclusion *independently*, without needing help from the other.

B

Option 1:



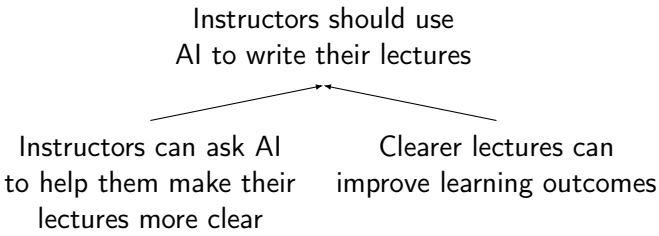
Option 2:



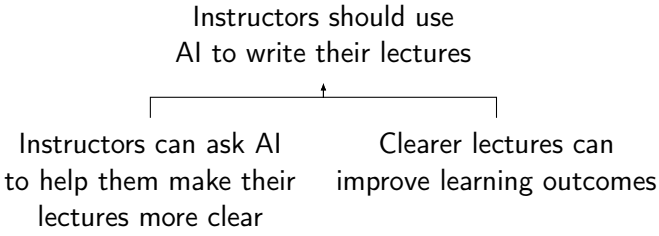
Option 2 is correct: it gives a good inductive argument, whereas Option 1 tries to establish that Broccoli is high in vitamins because it is healthy, even though there are other ways for a food to be healthy.

C

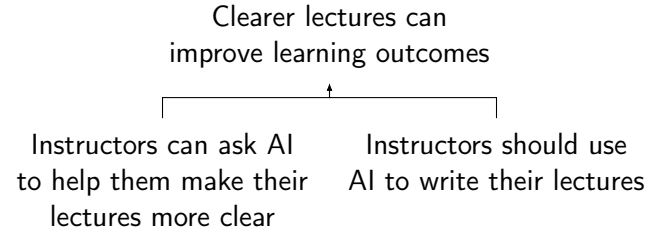
Option 1:



Option 2:



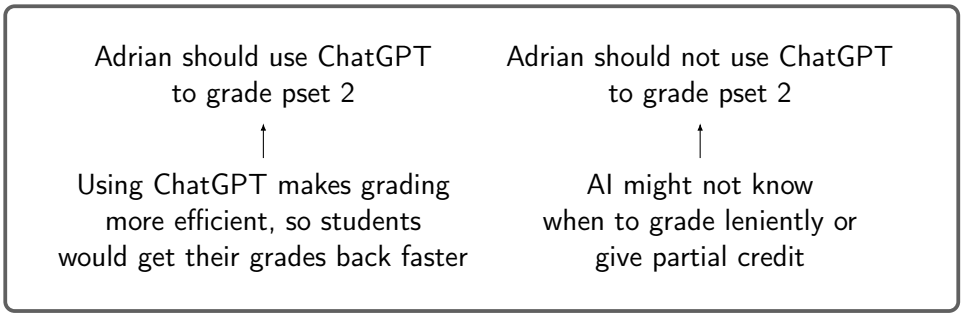
Option 3:



Option 2 is correct: here the two premises work together support the conclusion. They don't support the conclusion separately (as Option 1 suggests), and the support relations don't make sense in Option 3.

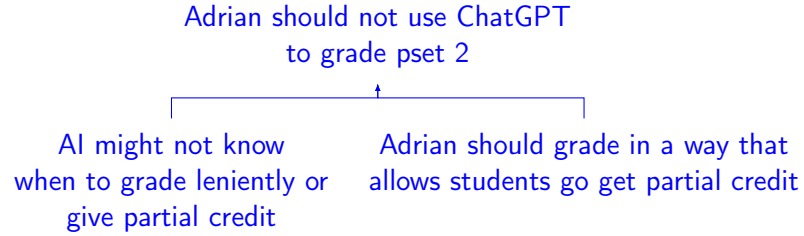
2.3 | Making an Argument Map (10 points)

Here are two arguments, one for the conclusion that Adrian *should* use AI to grade pset 2, and one for the conclusion that Adrian *should not*:

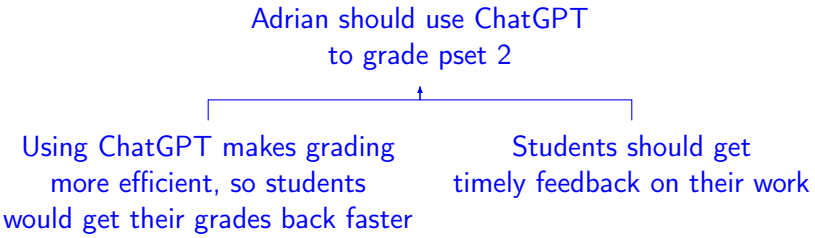


Choose **one** of these arguments, and do **both of** the following:

1. Add another premise beside the premise (a "co-premise") that makes the argument stronger (5 points). **Note:** this premise has to be part of the *same* argument for the conclusion, not a separate argument.
2. Formulate an *objection* to this argument: a statement/consideration that makes this argument less convincing (5 points).



Objection 1: Adrian could train AI to give partial credit. Objection 2: Adrian might not be able to give partial credit as fairly as AI could.



Objection 1: ChatGPT may make more mistakes than Adrian, so it may not be more efficient overall. Objection 2: Students would not get feedback from their instructor, but rather just an AI.