Part 1 *Your answer to this part should be entered/uploaded directly to Crowdmark.*

Rewrite the following informal statements precisely, using linear algebra vocabulary.

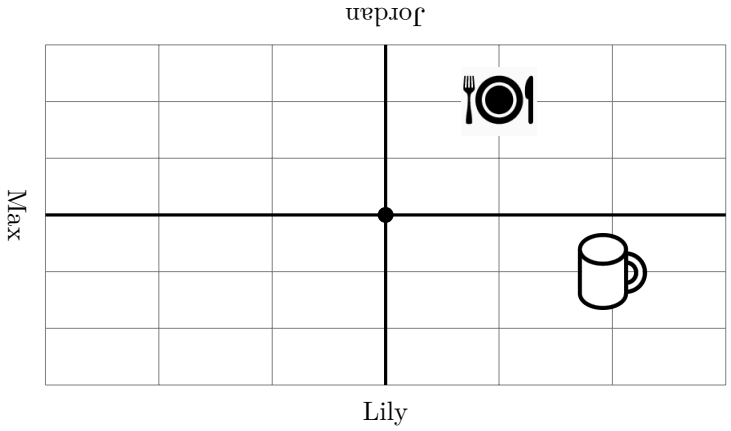
a. $\vec{v}$ points vertically.

b. A plane has two directions.

c. $\vec{x} + \begin{bmatrix} 5 \\ 0 \end{bmatrix}$ is a translation.

(PAR) Part 2 *Prepare your response to this part on the PAR Worksheet. You will bring your writeup of this problem to class and will upload* both *your draft and a final version to Crowdmark after completing the PAR process.*

Jordan, Max, and Lily are having a conversation at the breakfast table while admiring a new tablecloth.



MAX: "Pass me the mug at $(1, 2)$, please."

LILY: "That's a plate."

MAX: "No, the plate's at $(-2, 1)$. The mug's right next to you."

LILY: "Then why'd you say $(1, 2)$ when it's clearly at $(2, -1)$?"

Jordan, who's been studying linear algebra, pipes up.

JORDAN: "Cut it out, you two! You're both right."

Explain to Max and Lily (i) what is going on, (ii) why is there confusion, and (iii) is one more right than the other (or are they both wrong). Your explanation must include linear algebra terminology, and should be aimed at the level of a MAT223 who has missed the last two weeks of class. That means, you should explain any newer linear algebra concepts/terminology you use.

Part 3 *Your answer to this part should be entered/uploaded directly to Crowdmark.*

Toronto's streets are not aligned with longitude and latitude. Instead, "north–south" streets (like University or Spadina) are approximately 17 degrees off from true north. Give two situations where "street coordinates" would be better than longitude and latitude, or vice versa.