1.2.1 Notation

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Week 1 due Oct 5, 2023 03:12 IST Completed

1.2.1 Notation

Start of transcript. Skip to the end.

Dr. Robert van de Geijn: We're going to start the week by reviewing what

vectors are and what notations we're going to use throughout the course.

We're going to motivate our discussion of vectors with a

2-dimensional example.

Here we have a 2-dimensional grid, and

0:00 / 0:00 2.0x

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Reading Assignment

0 points possible (ungraded)

Read Unit 1.2.1 of the notes. [LINK]

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? Column vectors vs Row vectors — 5

Is there a reason why we are representing a vector as a column vector? Can we use row vectors here instead?

? euclidean length & hypotenuse — 4

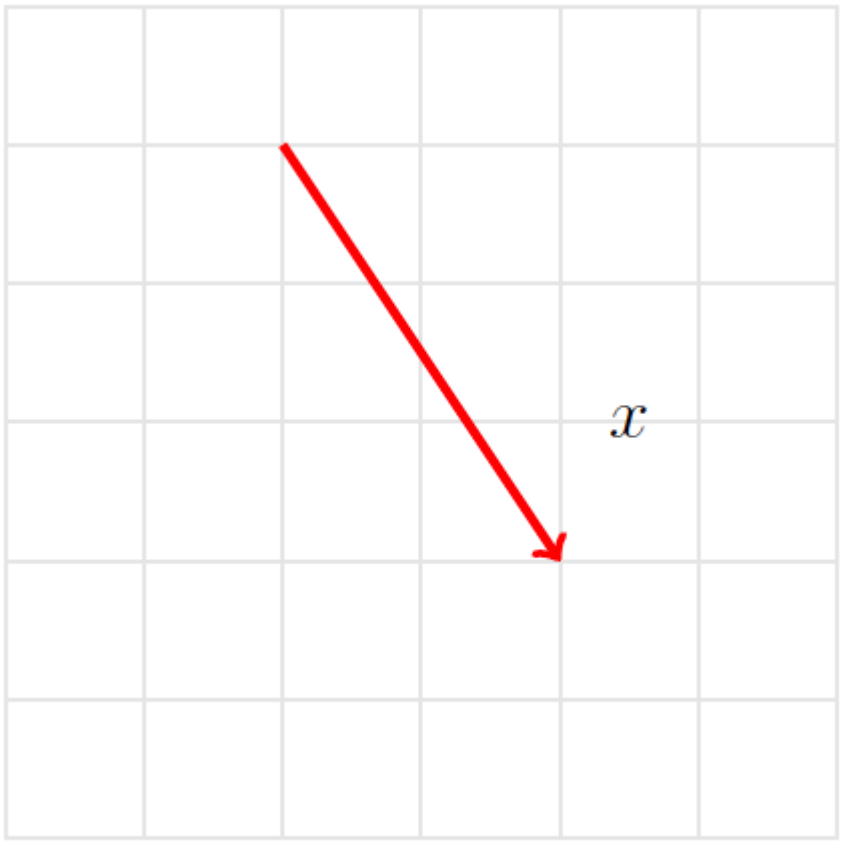
Watching the video, I drew a connection between Euclidean length and the hypotenuse in the Pythagorean theorem. Would that be an accurate ...

Homework 1.2.1.1

Calculator

1/1 point (graded)

Consider the following picture.



Using the grid for units,

- $x = \begin{pmatrix} -2 \\ -3 \end{pmatrix}$
- $x = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$
- **(selected)** $x = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$
- $x = \begin{pmatrix} -3 \\ -2 \end{pmatrix}$
- None of the above

✔

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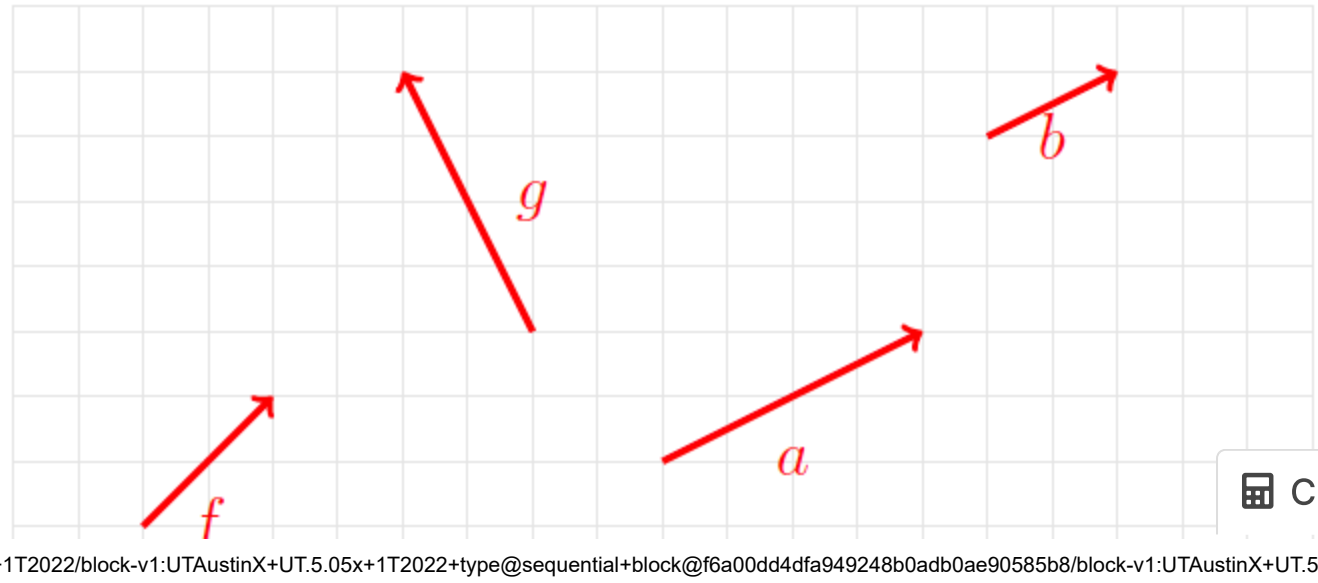
Answers are displayed within the problem

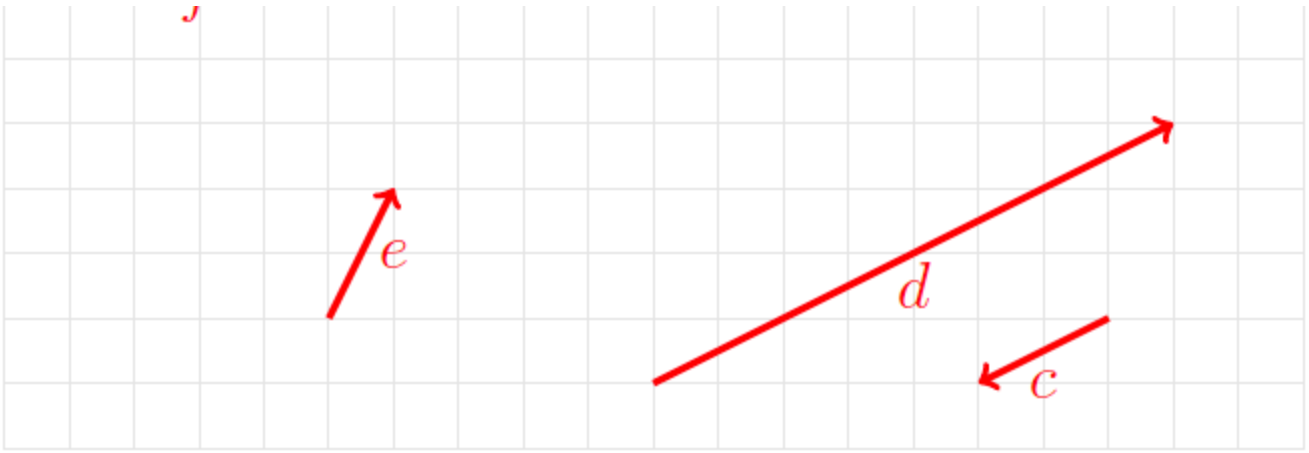
Homework 1.2.1.2

7/7 points (graded)

Consider the following picture.



Calculator



Using the grid for units, identify the letter associated with the given vector:

$\begin{pmatrix} 2 \\ 1 \end{pmatrix} =$

b ✔ Answer: b

$\begin{pmatrix} -2 \\ -1 \end{pmatrix} =$

c ✔ Answer: c

$\begin{pmatrix} -2 \\ 4 \end{pmatrix} =$

g ✔ Answer: g

$\begin{pmatrix} 8 \\ 4 \end{pmatrix} =$

d ✔ Answer: d

$\begin{pmatrix} 1 \\ 2 \end{pmatrix} =$

e ✔ Answer: e

$\begin{pmatrix} 4 \\ 2 \end{pmatrix} =$

a ✔ Answer: a

$\begin{pmatrix} 2 \\ 2 \end{pmatrix} =$

f ✔ Answer: f

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Answers are displayed within the problem

While a vector does not have location, but has direction and length, vectors are often used to show the direction and length of movement from one location to another. For example, the vector from point $(1, -2)$ to point $(5, 1)$ is the vector $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$.

Calculator

$\begin{pmatrix} 3 \end{pmatrix}$

Hence, we might geometrically represent the vector $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$ by an arrow from point $(1, -2)$ to point $(5, 1)$.

Homework 1.2.1.3

10/10 points (graded)

The vector represented geometrically in $\mathbb{R}^2$ by

an arrow from point (−1, 2) to point (0, 0) can be written as $x =$

1 ✔ Answer: 1

-2 ✔ Answer: -2

an arrow from point (0, 0) to point (-1, 2) can be written as $x =$

-1 ✔ Answer: -1

2 ✔ Answer: 2

The vector represented geometrically in $\mathbb{R}^3$ by

an arrow from point (−1, 2, 4) to point (0, 0, 1) can be written as $x =$

1 ✔ Answer: 1

-2 ✔ Answer: -2

-3 ✔ Answer: -3

an arrow from point (1, 0, 0) to point (4, 2, -1) can be written as $x =$

3 ✔ Answer: 3

2 ✔ Answer: 2

-1 ✔ Answer: -1

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