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Question: Using the properties of an inner product, prove that

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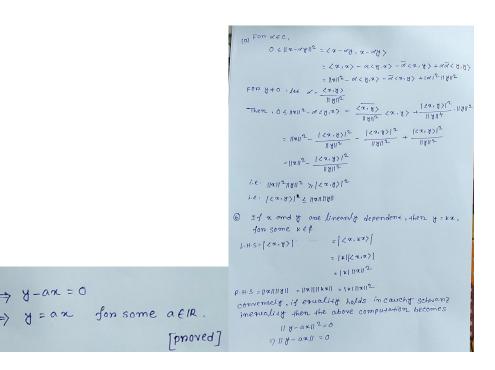
Using the properties of an inner product, prove that the Cauchy-Schwarz inequality holds for any "induced norm".

- (a) Specifically, show that if $||x|| = \sqrt{\langle x, x \rangle}$, then for any x, y we have $|\langle x, y \rangle| \le ||x|| ||y||$. [Hint: Consider writing x as a linear combination of y and the vector $z = x \frac{\langle x, y \rangle}{||y||^2} y$. What is $\langle z, y \rangle$? What can we infer from the previous problem?]
- (b) *Optional: Show that equality holds if and only if y = ax for some $a \in \mathbb{R}$.

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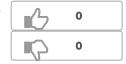
Expert Answer





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- I, we must also have Prove that if A and B are square N x N matrices, then if AB BA=I. Some hints to help you get started: = T. • An equivalent statement to BA=I is that, for any x ERN, BAx - • Think about what can you say about R(AB). • Think about what you can say about the relationship between R(AB) and R(B). • Recall that for any X E R(B), we can write x as a linear...

See answer

1) At the instant shown, the truck travels to the right at 3 m/s, while the pipe rolls counterclockwise at 6 rad/s without slipping at B. Determine the velocity of the pipe's center G. 15 m

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