

[Course](#)

[Progress](#)

[Dates](#)

[Discussion](#)

[Syllabus](#)

[Outline](#)

[laff routines](#)



[Community](#)







[Course](#) / [Week 9: Vector Spaces](#) / [9.5 Span, Linear Independence, and Bases](#)




< Previous



Next >

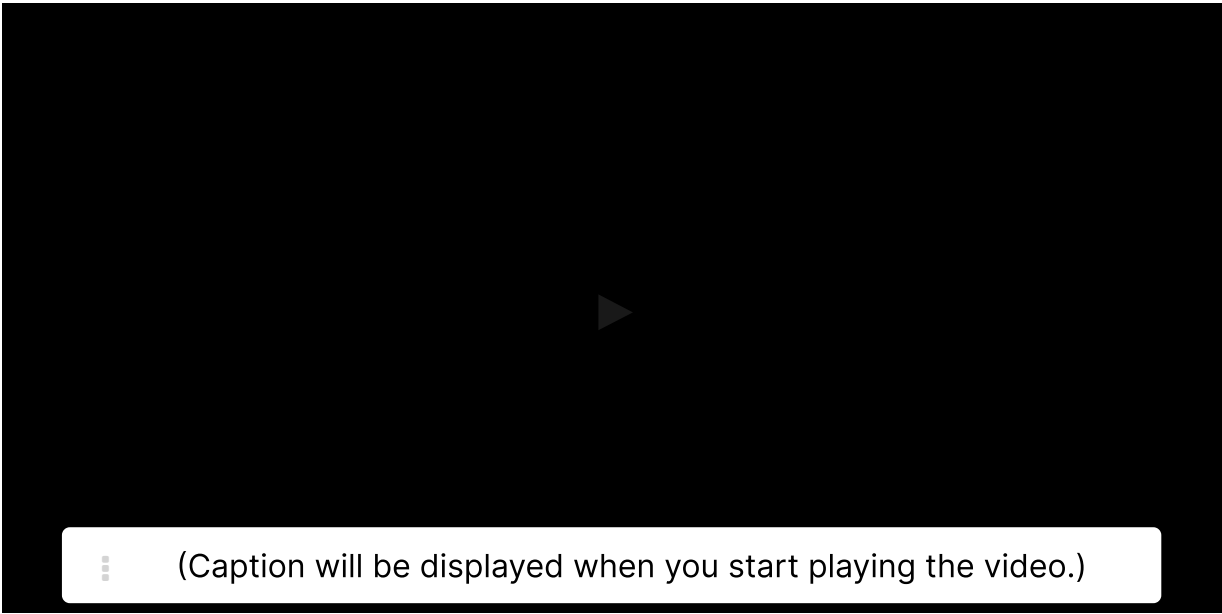
# 9.5.4 The Dimension of a Subspace

 Bookmark this page

# 9.5.4 The Dimension of a Subspace

## Video

[Start of transcript. Skip to the end.](#)



Dr. Robert van de Geijn: We are now at the point

where we can discuss the dimension of a subspace,

which we're going to see is closely related to the rank of a matrix.

Bases are not unique.

We talked about a basis of a subspace.

## Video

[Download video file](#)

## Transcripts

[Download SubRip \(.srt\) file](#)

[Download Text \(.txt\) file](#)

## Reading Assignment

0 points possible (ungraded)

Read Unit 9.5.4 of the notes. [\[LINK\]](#)

☒ Done



Submit

✓ Correct

## Discussion

Topic: Week 9 / 9.5.4

Hide Discussion

Add a Post

← All Posts

why  $w_j = v x_j$ ?

discussion posted about a year ago by [yikaiyang1997](#)

what i understand is  $w_j$  is a vector in subspace so it can be linear combination of  $v(i \text{ to } j)$ . so is  $w_j = v x_j$  means that  $x_j$  is a lineaer combinatiuon?



Calculator

This post is visible to everyone.

Add a Response

1 response

**maggiemyers** (Staff)  
about a year ago



$w_j$  is a vector.  $V$  is a matrix whose columns consists of the basis vectors for the space. As you said,  $w_j$  is a linear combination of the columns of  $V$  so it can be written as  $\chi_0 v_0 + \dots + \chi_n v_n$  which notice is exactly what you get if you multiply  $Vx_j$  where the components of  $x_j$  are these  $\chi's$

To convince yourself of this, you may want to try it with a  $V$  from the homework, create a  $w$  by taking a linear combination of the columns of  $V$  then form the  $x$  from the scalars in that linear combination. Create the matrix vector multiply and see the results.

Add a comment

Showing all responses

Add a response:

Preview

< Previous

Next >



## edX

- About
- Affiliates
- edX for Business
- Open edX
- Careers
- News

## Legal

- Terms of Service & Honor Code
- Privacy Policy
- Accessibility Policy
- Trademark Policy

Calculator

[Sitemap](#)

[Cookie Policy](#)

[Your Privacy Choices](#)

# Connect

[Idea Hub](#)

[Contact Us](#)

[Help Center](#)

[Security](#)

[Media Kit](#)



© 2023 edX LLC. All rights reserved.

深圳市恒宇博科技有限公司 [粤ICP备17044299号-2](#)