

3.1, 3.2 and 3.3 Handwrite

Welcoming Environment: Actively listen to others and encourage everyone to participate! Keep an open mind as you engage in our class activities, explore consensus and employ collective thinking across barriers. Maintain a professional tone, show respect and courtesy, and make your contributions matter.

Discuss and keep track of any questions your group has. Ask me questions during group work time as well as when I bring us back together. Try to help each other solidify and review the language of linear algebra, algebra, visualizations and intuition from this section, including those related to:

- determinant computations: diagonal method or cofactor expansion method (Laplace expansion)
- determinant of a triangular matrix or a transpose of a matrix
- impact of row operations on determinants
- connection of determinants to invertibility and what makes a matrix invertible
- determinants as area of parallelogram or volume of parallelepiped and the impact of row operations

Take out your notes from the activities due today as well as both fill-in guides. Use them and each other to respond to the following by handwriting in the language of our class. Use only what we have covered so far in our readings, videos and quizzes.

1. **Building Community:** What are the preferred first names of those sitting near you? If you weren't able to be there, give reference to anyone you had help from or write N/A otherwise.

2. Given
$$\begin{bmatrix} 3 & 0 & 4 \\ 2 & 3 & 2 \\ 0 & 5 & -1 \end{bmatrix}$$

- a) Compute the determinant by hand using the cofactor expansion (also called the Laplace expansion) along the **first row**. Show all items in the cofactor expansion, i.e. with the numbers filled in for $\sum_1^n a_{ij}(-1)^{i+j}|\text{matrix obtained by eliminating row } i \text{ and column } j|$
- b) Compute the determinant by hand using the cofactor expansion (also called the Laplace expansion) along the **second column**. Show all items in the cofactor expansion.
- c) Compare your responses in a) and b).

3. Sketch a parallelepiped that isn't squished and is formed by 3 vectors, all starting at one of the vertices. Then shade the absolute value (or magnitude) of the determinant of the matrix formed by these 3 vectors generating it.

Next, as time allows before I bring us back together, work on the additional activities including any pollev activities and respond in your notes rather than here.

Help each other and PDF responses to ASULearn: If you are finished with the handwrite and additional activities before I bring us back together, first ensure that your entire group is finished too, and if not, help each other. Then submit your handwrite, continue reviewing and solidifying or discuss upcoming class work.

Collate your handwritten responses, preferably on this handout, into one full size multipage PDF for submission in the ASULearn assignment. I recommend you turn it in sometime today, but you have until the morning before the next class.