

Homework Assignment #1

(due Aug. 24, 2022, at beginning of class)

1. Watch the movie “Picture of a scientist”. (Authors: Ian Cheney; Sharon Shattuck; Manette Pottle; Nancy Hopkins; Raychelle M Burks)

The movie is accessible via the Bucknell library:

https://bucknell.worldcat.org/title/picture-a-scientist/oclc/1250647539&referer=brief_results

At the beginning of next class we will talk about Diversity, Equity, and Inclusion (DEI). We will start with a discussion of this movie.

Take Notes (Your Notes are the answer to this question and will be graded solely on effort.): While you are watching the movie take notes for your answer to the following questions:

- Which discriminations and harrassments are described? Take note not only of grave incidents but also of seemingly smaller incidents. What were the impacts?
 - Some of the described discriminations and harrassments are targeted not only towards women but also to other minoritized groups. Which discriminations and which groups?
 - Any other comments/thoughts you would like us to discuss on Wednesday, April 24. (We will talk about discriminations and allyship.)
2. Find the separation vector \mathbf{r} from the source point (4,1,6) to the field point (5,3,4). Determine its magnitude (r), and construct the unit vector $\hat{\mathbf{r}}$.
 3. Using arrows of appropriate relative magnitude and direction, sketch a representative set of vectors for each of the following vector fields:
 - (a) $\mathbf{f}(\mathbf{r}) = -y \hat{\mathbf{x}} + x \hat{\mathbf{y}}$
 - (b) $\mathbf{g}(\mathbf{r}) = (-y \hat{\mathbf{x}} + x \hat{\mathbf{y}})/(x^2 + y^2)$
 - (c) $\mathbf{h}(\mathbf{r}) = \hat{\mathbf{x}} + \hat{\mathbf{y}}$
 4. Determine the cross product $\mathbf{A} \times \mathbf{B}$ for the case of the vectors $\mathbf{A} = 4\hat{\mathbf{x}} - 2\hat{\mathbf{y}} + 5\hat{\mathbf{z}}$ and $\mathbf{B} = -\hat{\mathbf{x}} + 6\hat{\mathbf{z}}$.