

Information on First Midterm

The midterm is Wednesday, April 25, in class. *You must take it in the class at the time you are officially enrolled.* Please arrive early to ensure you get the full 50 minutes.

It includes the material we covered in lecture through Monday April 16, and on homeworks 1–4. (Only part of homework 4 is eligible for inclusion, as indicated below.)

Study your lecture notes and the homework problems. For practice problems, look in the same sections of the book where the homework was assigned from, and do problems similar to the assigned ones. You can also make up practice problems by changing the numbers in other problems.

Please bring your student ID, approved calculator, pencils, and erasers. We'll supply a test book, so you don't need a blue book or scantron. No other resources are permitted.

Homework #4, Due Thursday, April 26

10.1# 2, 3, 6, 8–10, 17 (these problems are not covered on the first midterm, and the book's answers to #17 are inaccurate)
and the problems below (which may be covered on the first midterm).

Problem H-4. Consider the plane $2y + 3x = 5z - 30$.

- (i) Rewrite the equation in the format $ax + by + cz = d$.
- (ii) Rewrite the equation in the format $\vec{n} \cdot (\vec{r} - \vec{r}_0) = 0$, in four different ways; the first three ways should have \vec{r}_0 correspond to the point the plane hits the x , y , and z axes, and the fourth should be anything else.
- (iii) Draw the plane: plot the three points in (ii) that are on the axes, connect them into a triangle, shade it in, and indicate that the plane just extends the triangle.

Problem H-5. Two lines are defined by parametric equations

line 1: $x = t + 2 \quad y = 3t - 2 \quad z = 5 - t \quad \text{where } -\infty < t < \infty$

line 2: $x = 4 + u \quad y = 3 + 2u \quad z = 2 - 2u \quad \text{where } -\infty < u < \infty$

- (i) These lines intersect each other. Give the (x, y, z) coordinates of the point of intersection.
Hint: Set the x equations equal to each other, and same for y and z , to solve for t and u . Plug in the value of t or u to get the point (x, y, z) .
- (ii) Compute the angle between the lines at the intersection point. *Hint:* Rewrite the lines in vector parametric form, and find the angle between the direction vectors.