Name: **Tutorial day and time:**

Number of the *completed* problem you want feedback on:

1. Find the distance between the skew lines

$$\ell_1(t) = \langle x, y, z\rangle = \langle 1, 2, 1\rangle + s\langle 2, -1, 1\rangle$$
$$\ell_2(t) = \langle x, y, z\rangle = \langle 3, 3, 3\rangle + t\langle 4, 2, -1\rangle$$

using the method of Example 56 in the text.
(Recognizing that skew lines lie in parallel planes, use the direction vectors of ℓ_1 and ℓ_2 to construct the common normal vector of the two planes. Choosing one point on either line, you can construct a vector with its tail on one plane, and tip on the other. Projecting this vector onto the normal vector gives you a vector whose length gives you the distance between the two planes, which is also the shortest distance between the two lines.)

2. Given the matrices $A = \begin{bmatrix} 2 & -3 \\ 1 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} -7 & 2 \\ -1 & 4 \end{bmatrix}$, find and simplify the following matrices:

   (a) $A + B$

   (b) $4B - 5A$

   (c) $2(A - B) - (A - 2B)$ (Hint: you may want to first simplify the expression before plugging in values.)

3. Prove that for any $m \times n$ matrices A and B, and any scalar k, we have $k(A+B) = kA+kB$.