Name: **Tutorial time:**

Problem you want feedback on:

Please complete all problems below, and indicate which **one** problem you want feedback on.

1. Let $\vec{u} = \begin{bmatrix} 2 \\ -3 \\ 1 \end{bmatrix}$ and $\vec{v} = \begin{bmatrix} -4 \\ 0 \\ 3 \end{bmatrix}$. Calculate the following:

   (a) $\vec{u} + \frac{1}{2}\vec{v}$

   (b) $\vec{u} \cdot \vec{v}$

   (c) $\|\vec{v}\|$

   (d) Find a unit vector in the direction of $\vec{v}$.

2. Let $P = (2, -1, 3)$ and $Q = (0, 3, -2)$. Find the coordinates of the point R that is $\frac{1}{5}$ of the way from P to Q.

3. Find the parametric equations of the line that passes through the points $P = (3, -1, 4)$ and $Q = (1, 0, 2)$.

4. Let L be the line given by the parametric equations

$$\begin{aligned} x &= 2 - t \\ y &= -3 + 2t \\ z &= 1 + t \end{aligned}$$

Determine a point P on the line L such that the distance from P to $(2, -3, 1)$ is equal to 3.