Problem 1

Plot (draw) the vectors $\vec{u} = 3i$, $\vec{v} = 2j$ and $\vec{w} = -i + 3j$. Then (based on your drawing) plot the vectors $\vec{u} - \vec{v}$ and $\vec{v} - \vec{w}$. Check that your drawing corresponds to the prescribed algebra.

Problem 2

Find the vector with initial point $P(1, 2, 3)$ and terminal point $Q(2, 4, 1)$ then compute it's length and direction.

Problem 3

Find the unit vector that makes an angle of $2\pi/3$ with the positive x-axis. Extra credit: Find all vectors in 3-space with this property and describe them with an equation and inequality.

Problem 4

Find the direction and magnitude of the vector $3i - 2j + 1k$.

Problem 5

For a general vector $\vec{v}$ in $\mathbb{R}^3$, show that $\dfrac{\vec{v}}{|\vec{v}|}$ is always a unit vector.