Worksheet 1: vectors and forces

1. What is the general form of a vector \( \mathbf{v} \) on the plain that points upward and forms the angle of \( \pi/6 \) with the positive direction of the \( x \)-axis?

2. Find two vectors \( \mathbf{v}_1 \) and \( \mathbf{v}_2 \) on the plane such that \( \mathbf{v}_1 \) forms the angle of \( \pi/6 \) with the positive direction of the \( x \)-axis, \( \mathbf{v}_2 \) forms the angle of \( 3\pi/4 \) with the positive direction of the \( x \)-axis, and \( \mathbf{v}_1 + \mathbf{v}_2 = \langle 0, -10 \rangle \).

3. A small block of mass 1kg hangs on two chains such that one chain forms the angle of \( 45^\circ \) and the other the angle of \( 30^\circ \) with the horizontal. Find the forces that act on the block.