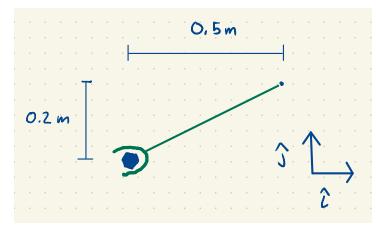
Name:

1. Find a vector perpendicular to the vectors $\mathbf{v} = \langle 2, 2, 1 \rangle$ and $\mathbf{w} = \langle 3, 1, 1 \rangle$.

2. Find the equation of a plane that passes through the points 0(0,0,0), P(2,2,1) and Q(3,1,1).

3. Find the equation of a plane that is parallel to the plane you found in problem 2 but that passes through the point R(5, 1, 4).

A wrench is tightening a nut as in the diagram below. The nut is located at the origin and the far end of the wrench is located at the point $\mathbf{r} = \langle 0.5, 0.2, 0 \rangle$ with distance measured in meters. A force vector \mathbf{F} is applied: \mathbf{F} points in the direction $\langle 1, -1, 0 \rangle$ and has total length of 100 N.



- **4.** Add a force vector in the diagram. It should point roughly in the right direction. Then determine if the applied torque is pointing into or out of the page.
- 5. Compute the torque vector. Please remember to include units!