

Instructions: Show all work. Use exact answers unless otherwise asked to round.

1. Consider the vector field $\vec{F} = \langle -y, x \rangle$. Sketch at least 10-12 points of the field in the plane, and describe the general behaviour of the field.
2. Write the equation of the line passing through the points $P(1,2,3)$, $Q(4,-1,2)$ in
 - a. Symmetric form.
 - b. Parametric form.
 - c. Vector-valued function form.
3. Find the domain of $\vec{r}(t) = \left(\frac{1}{t-2}\right)\hat{i} + (\ln t)\hat{j} + (\sqrt{t^2-1})\hat{k}$. Give your answer in interval form.