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Show all work. 5 points each.

1) Find the velocity  $\mathbf{v}$  and speed  $|\mathbf{v}|$  for  $\mathbf{R} = t\mathbf{i} + \frac{1}{t}\mathbf{j}$

2) Set up the integral for the arc length function,  $s(t)$ ,  $\mathbf{R} = \cos(t)\mathbf{i} + \sin(t)\mathbf{j} + t\mathbf{k}$