"QUIZ" for Lecture 5

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1, Find the curvature for
$$\mathbf{r}(t) = \sin t\,\mathbf{i} + \cos t\,\mathbf{j} + t\,\mathbf{k} \quad .$$

$r'(t) = \cos t\,i - \sin t\,j + k \quad r''(t) = -\sin t\,i - \cos t\,j$

$k = \dfrac{\sqrt{(\cos t)^2 + 2\cos t * \sin t + 2}}{2^{\frac{3}{2}}}$

2.: Find the velocity, acceleration, and speed of a particle with the given position function.
$$\mathbf{r}(t) = t\,\mathbf{i} + t^2\,\mathbf{j} + 5\,\mathbf{k} \quad .$$

$v(t) = r'(t) = i + 2 * tj$

$a(t) = v'(t) = r''(t) = 2j$

$s(t) = |v(t)| = \sqrt{1 + 4t^2}$