**Problem statement** The three-dimensional parametric curve $C$ is defined by the equations

$$\begin{cases} x = \cos(t) \\ y = \sin(t) \\ z = t^2 \end{cases}.$$

a) Verify that the curvature is given by the formula $\kappa(t) = \sqrt{\dfrac{5 + 4t^2}{(4t^2 + 1)^3}}$.

b) Explain briefly using the formula in a) why $\lim\limits_{t \to \infty} \kappa(t) = 0$.

c) The first two coordinates of this curve describe uniform circular motion. Explain why this statement is consistent with the limit evaluated in b). (You may wish to use pictures to help your explanation.)