7. $\vec{r}(t) = 3\vec{i} + 4\cos t\,\vec{j} + 4\sin t\,\vec{k}$, $t = \pi$

$\vec{r}\,'(t) = -4\sin t\,\vec{j} + 4\cos t\,\vec{k}$

$\|\vec{r}\,'(t)\| = \sqrt{(-4\sin t)^2 + (4\cos t)^2} \longrightarrow \|\vec{r}\,'(\pi)\| = 4$

$= \sqrt{16\sin^2 t + 16\cos^2 t}$

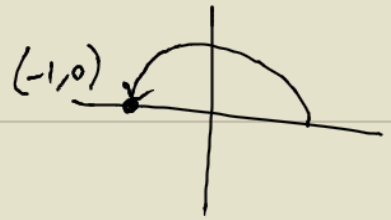
$= \sqrt{16(\sin^2 t + \cos^2 t)}$

$= \sqrt{16(1)}$

$= 4$

$\vec{T}(t) = \dfrac{\vec{r}\,'(t)}{\|\vec{r}\,'(t)\|} = \dfrac{-4\sin t\,\vec{j} + 4\cos t\,\vec{k}}{4} = -\sin t\,\vec{j} + \cos t\,\vec{k}$

$\vec{T}\,'(t) = -\cos t\,\vec{j} - \sin t\,\vec{k}$



$\vec{T}\,'(\pi) = -\cos\pi\,\vec{j} - \sin\pi\,\vec{k}$

$= -(-1)\,\vec{j}$

$= \vec{j}$

$\|\vec{T}\,'(\pi)\| = \sqrt{1^2} = 1$

$K = \dfrac{\|\vec{T}\,'(\pi)\|}{\|\vec{r}\,'(\pi)\|} = \boxed{\dfrac{1}{4}}$