1. $\underline{v}(t) = \underline{r}'(t) = \langle 0, 10, 25-10t \rangle$

$v(t) = \|\underline{v}(t)\| = \sqrt{0^2 + 10^2 + (25-10t)^2}$

$\quad = \sqrt{100 + 625 - 500t + 100t^2}$

$\quad = \sqrt{100t^2 - 500t + 725}$

$\quad = 5\sqrt{4t^2 - 20t + 29}$

$\underline{a}(t) = \underline{v}'(t) = \underline{r}''(t) = \langle 0, 0, -10 \rangle$

$K(t) = \dfrac{\|\underline{r}'(t) \times \underline{r}''(t)\|}{\|\underline{r}'(t)\|^3} = \dfrac{\|\underline{v}(t) \times \underline{a}(t)\|}{(v(t))^3}$

$\underline{v}(t) \times \underline{a}(t) = \begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ 0 & 10 & 25-10t \\ 0 & 0 & -10 \end{vmatrix}$

$\quad = \langle -100, 0, 0 \rangle$

$\|\underline{v}(t) \times \underline{a}(t)\| = \sqrt{(-100)^2 + 0^2 + 0^2} = 100$

$K(t) = \dfrac{100}{125(4t^2 - 20t + 29)^{3/2}} = \dfrac{4}{5}(4t^2 - 20t + 29)^{-3/2}$