퀴즈풀기

1. $\vec{v_2} = (2,-1,0)$

$\vec{v_2} = (1,1,-1)$

$\vec{v_3} = (-1,0,3)$ } 2개 ⇒ $\vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix}$

$\vec{v_1} \cdot (\vec{v_2} \times \vec{v_3})$ $= \begin{vmatrix} a_2 & a_3 \\ b_2 & b_3 \end{vmatrix} \vec{i} - \begin{vmatrix} a_1 & a_3 \\ b_1 & b_3 \end{vmatrix} \vec{j} + \begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix} \vec{k}$

step1) 외적 $\begin{vmatrix} i & j & k \\ 1 & 1 & -1 \\ -1 & 0 & 3 \end{vmatrix}$

$= 3i - (3-1)j + (+1)k$

$= 3i - 2j + k \rightarrow (3,-2,1)$

step2) 내적 $(2,-1,0) \cdot (3,-2,1)$

$= 6 + 2 + 0 = 8$

2. $\vec{r}(t) = (2\cos t, -t, -2\sin t)$ 2 구간은 $t=0$, $t=2\pi$ 사이의 길이

$\int_a^b |\vec{r}(t)|\, dt$ 가 길이를 의미

$\vec{r}'(t) = (-2\sin t, -1, -2\cos t)$

$|\vec{r}'(t)| = \sqrt{4\sin^2 t + 1 + 4\cos^2 t}$

$= \sqrt{5}$

$\int_0^{2\pi} \sqrt{5}\, dt$

$= 2\sqrt{5}\pi$