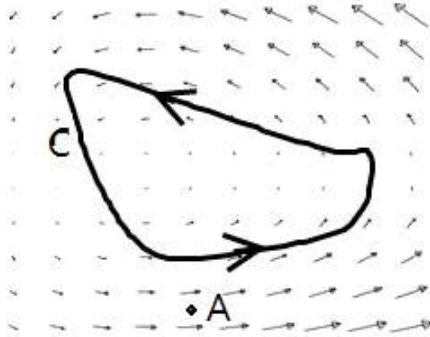


2015학년도 2학기 수학2 Tutor 강의 시연 문제지

※ 다음 문제 중 각자 배당된 유형의 문제를 풀어보고, 면접시간에 튜티에게 가르친다고 가정하고 발표한다. 면접자 상호간의 질문도 가능하니, 다른 유형의 문제도 풀어 보고 튜티의 입장에서 예상 가능한 질문을 생각해본다.

A형	<p>Show that if $f(x, y)$ is differentiable at (x_0, y_0), then</p> <p>(1) $D_{\vec{u}}f(x_0, y_0) = \nabla f(x_0, y_0) \cdot \vec{u}$, where \vec{u} is a unit vector.</p> <p>(2) f increases most rapidly in the direction of the gradient at (x_0, y_0).</p>
B형	<p>The following shows a continuous vector field \mathbf{F} and a smooth curve C in the xy-plane.</p> <div style="text-align: center;">  </div> <p>Which of the following statements are correct? Choose all.</p> <p>a) \mathbf{F} is a conservative vector field.</p> <p>b) \mathbf{F} is an irrotational vector field (that is, $\text{curl } \mathbf{F} = \langle 0, 0 \rangle$.)</p> <p>c) $\int_C \mathbf{F} \cdot d\mathbf{r}$ is positive.</p> <p>d) At the point A, $\text{div} \mathbf{F}$ is positive.</p>
C형	<p>Consider the surface G given by $z = \sqrt{1-y^2}$, $0 \leq x \leq 1$.</p> <p>1) Find the upward unit normal vector to G.</p> <p>2) If the surface G is submerged in a fluid with the velocity vector field $\mathbf{F} = \langle \arctan y, -x, -2 \rangle$, calculate the flux across to G.</p>