

1. Express the homogenous 3D transformation defined by the matrix  $\begin{bmatrix} 0 & -1 & 0 & 2 \\ 1 & 0 & 0 & 3 \\ 0 & 0 & 1 & 4 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

as a sequence of transformations in the following ways:


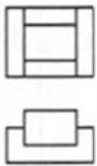

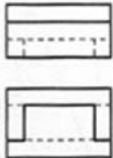
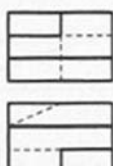
(1) A rotation followed by a translation (5 pts)

(2) A translation followed by a rotation (5 pts)

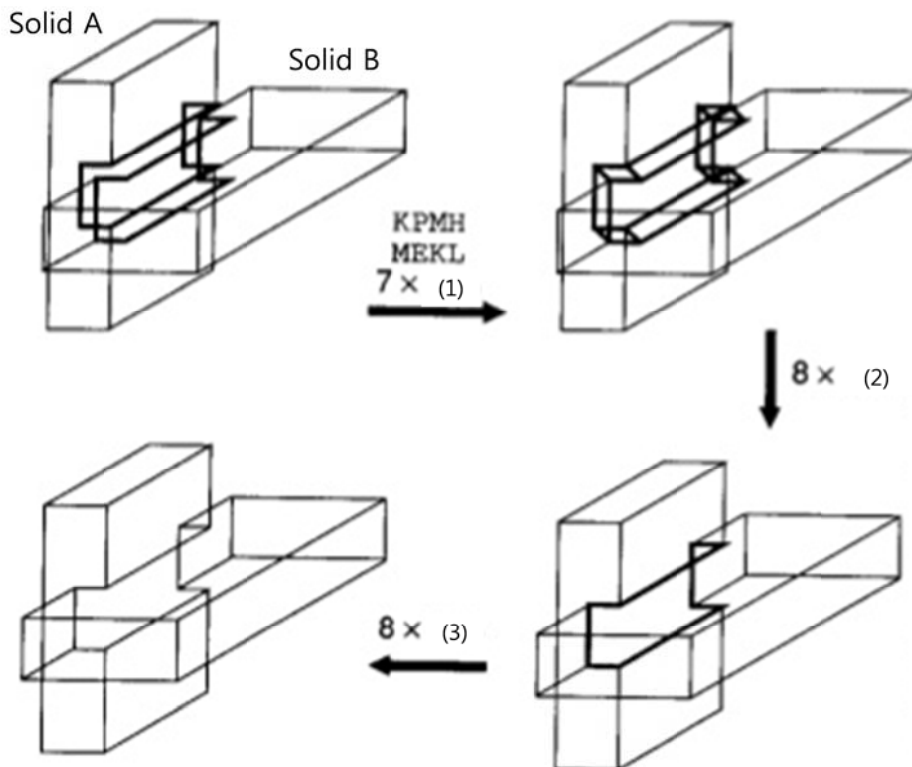
Express the 2D linear transformation defined by the matrix  $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$

(3) A shear along the x axis followed by a nonuniform scale followed by a shear along the y axis (5 pts)

2. For the multi-view projections shown in each lettered cell shown below (a)-(e), select the correct corresponding isometric view in the row. (10 pts)

<p>(a)</p> 	A	B	C	D	E
<p>(b)</p> 	A	B	C	D	E
<p>(c)</p> 	A	B	C	D	E
<p>(d)</p> 	A	B	C	D	E
<p>(e)</p> 	A	B	C	D	E

3. 다음은 Solid A와 Solid B를 union 하는 Boolean operation 과정이다. 괄호 안에 맞는 Euler operator (1)~(3)을 기입하시오. (10 pts)

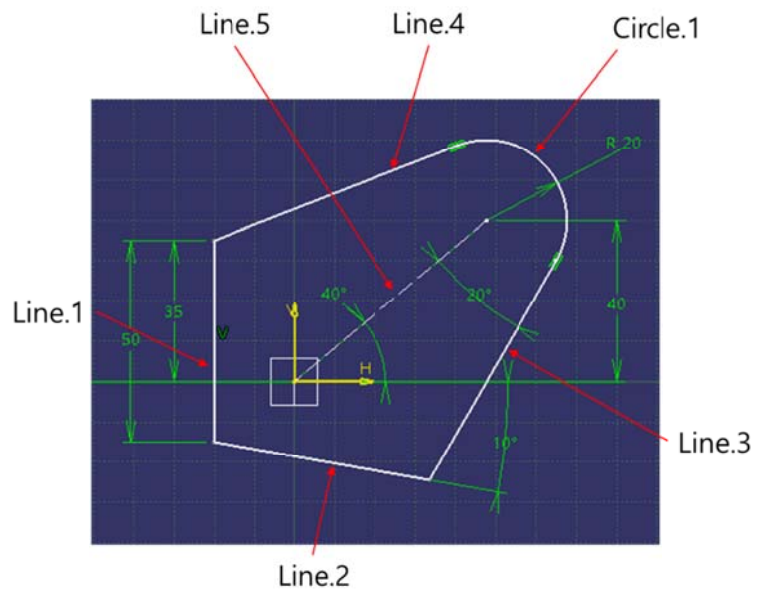


4. Parametric Representation

- (1) Give a parametric representation of a ray that starts at the eye E, passes through pixel center P, and then goes off to infinity. (5 pts)
  - (2) Give two reasons why a parametric curve representation:  $\mathbf{x} = \mathbf{F}_x(t)$ ,  $\mathbf{y} = \mathbf{F}_y(t)$ ,  $\mathbf{z} = \mathbf{F}_z(t)$  is preferable to the form:  $\mathbf{y} = \mathbf{f}_y(\mathbf{x})$ ,  $\mathbf{z} = \mathbf{f}_z(\mathbf{x})$  (10 pts)
5. 직사각형과 원 primitive 만을 이용하여 아래 소시지 형상을 CSG 로 모델링하려고 한다. 최소 수의 요소와 Boolean 연산으로 CSG tree 를 그리시오. (좌표변환은 무시) (10 pts)
6. 아래 sketch profile 에서 Line.1~5 및 Circle.1 중 현재 구속되지 않은 Geometry 는 총 몇 개이며 무엇인가? (12 pts)
7. Sketcher 에서 (a)~(c) 기능을 각각 설명하고 아래 profile 에 적용 시 예상되는 결과를 도시하시오. (2 pts each)

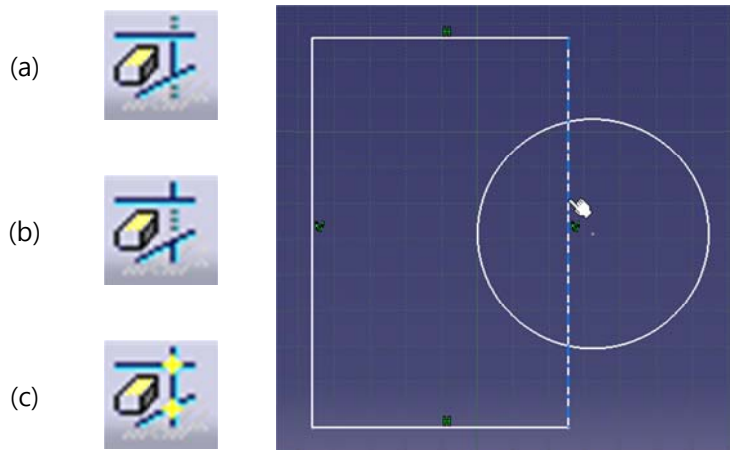


[문제 5]

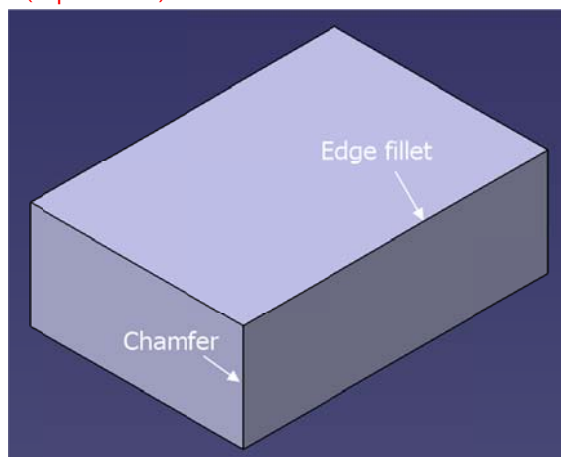


[문제 6]

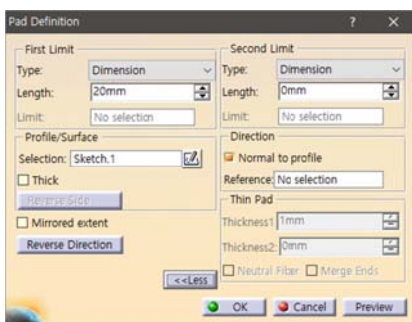
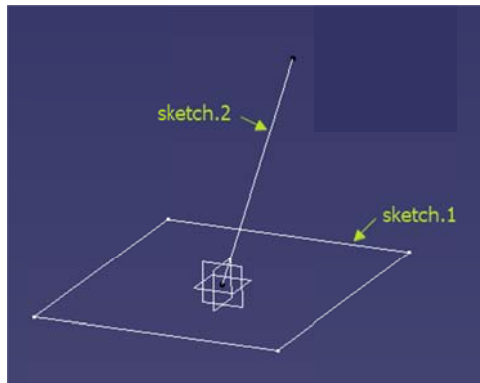
[문제 7]



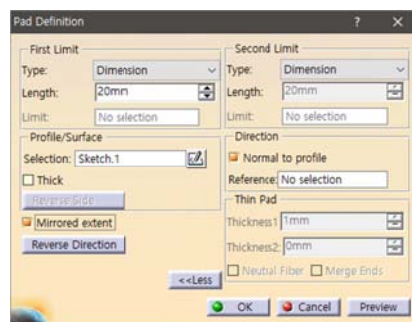
8. 아래 그림에서 Edge fillet 과 Chamfer 를 적용하려고 한다. 작업 순서에 따라 달라질 수 있는 형상을 각각 도시하시오. (3 pts each)



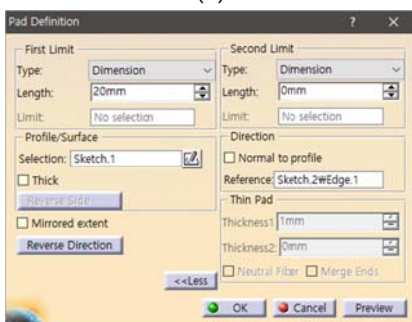
9. 아래 sketch 에 대해 pad 작업 (a)~(d)를 수행한다. 각각의 차이를 설명하고 결과를 도시하시오. (2.5 pts each)



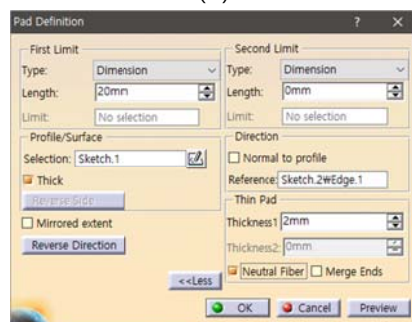
(a)



(b)



(c)



(d)

10. 아래의 part body 의 정면도(가운데)에서 오른쪽과 같이 보조선을 표시하는 Drafting 작업에 대해 기술하시오. (6 pts)

