

1. (20점) (1)~(3) 2점, (4)~(5) 4점, (5) 6점

$$(1) \begin{bmatrix} 1 & 0 & 3 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix} (2) \begin{bmatrix} \cos 45^\circ & -\sin 45^\circ & 0 \\ \sin 45^\circ & \cos 45^\circ & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} \sqrt{2}/2 & -\sqrt{2}/2 & 0 \\ \sqrt{2}/2 & \sqrt{2}/2 & 0 \\ 0 & 0 & 1 \end{bmatrix} (3) \begin{bmatrix} 1.4 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$(4) \begin{bmatrix} 1 & 0 & 4 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \cos 30^\circ & -\sin 30^\circ & 0 \\ \sin 30^\circ & \cos 30^\circ & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} \sqrt{3}/2 & -1/2 & 4 \\ 1/2 & \sqrt{3}/2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$(5) \begin{bmatrix} \cos 30^\circ & -\sin 30^\circ & 0 \\ \sin 30^\circ & \cos 30^\circ & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 4 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} \sqrt{3}/2 & -1/2 & 2\sqrt{3} \\ 1/2 & \sqrt{3}/2 & 2 \\ 0 & 0 & 1 \end{bmatrix}$$

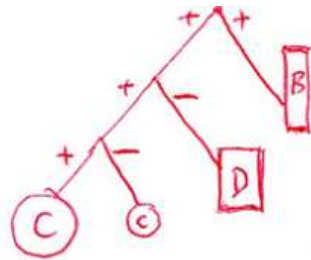
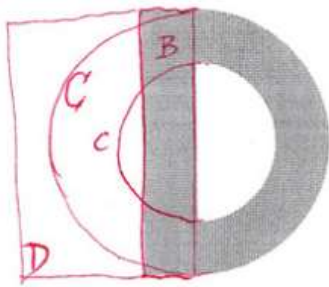
$$(6) \begin{bmatrix} 1 & 0 & 4 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \cos 30^\circ & -\sin 30^\circ & 0 \\ \sin 30^\circ & \cos 30^\circ & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & -4 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 4 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \sqrt{3}/2 & -1/2 & -2\sqrt{3} \\ 1/2 & \sqrt{3}/2 & -2 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} \sqrt{3}/2 & -1/2 & -2\sqrt{3} + 4 \\ 1/2 & \sqrt{3}/2 & -2 \\ 0 & 0 & 1 \end{bmatrix}$$

2. view site: origin, view point: camera (0,3,4) (T행렬 열별 5점)

$z_v = (0, 3, 4) \rightarrow k_v = (0, 0.6, 0.8)$ $z_v \perp y_v \rightarrow j_v = (0, 0.8, -0.6) \text{ or } (0, -0.8, 0.6) \xrightarrow[\text{(0,1,0)}]{\text{upvector}} j_v = (0, 0.8, -0.6)$ $T_{w \rightarrow v} = \begin{bmatrix} i \cdot i_v & j \cdot i_v & k \cdot i_v & p_x \\ i \cdot j_v & j \cdot j_v & k \cdot j_v & p_y \\ i \cdot k_v & j \cdot k_v & k \cdot k_v & p_z \\ 0 & 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0.8 & -0.6 & 0 \\ 0 & 0.6 & 0.8 & -5 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	
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Problem 3 (각 2점)					Problem 4 (5점, hatching 없으면 0점)
(a)	A	B	C	D	
(b)	A	B	C	D	
(c)	A	B	C	D	
(d)	A	B	C	D	
(e)	A	B	C	D	

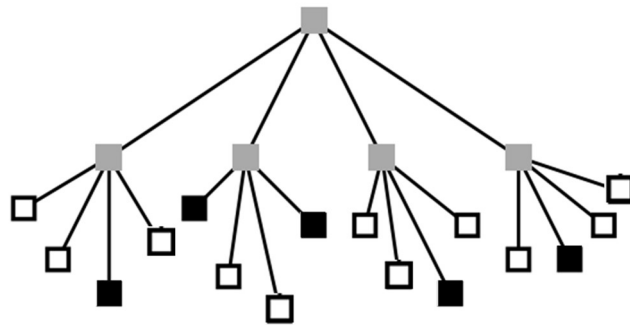
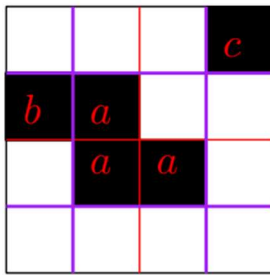
6. CSG tree 없으면 -2점, primitive 미사용 -5점



Primitive elements: 4개

Boolean Operation: 3개

7. 반대방향(반시계) -3점, tree 없으면 -3점



8. Euler eq: $V-E+f-H=2(S-P)$

		Vertex (1점)	Edge (1점)	Face (1점)	Hole loop(1점)	Shell (3점)	Passage (genus) (1점)	Euler (2점)
Large box	+	8	12	6	0	1	0	hold
Small box	-	+8	+12	+6	0	+1	0	hold
Small box	-	+8	+12	+6	0	+1	0	hold
Total		24	36	18	0	3	0	hold

9. (10점: $3*3+1$)

(1) point: c, e, g

(2) line: a, d, i

(3) plane reference: b, f, h

(a) Point-Point

(b) Parallel through point

(c) Between,

(d) Bisecting

(e) On curve

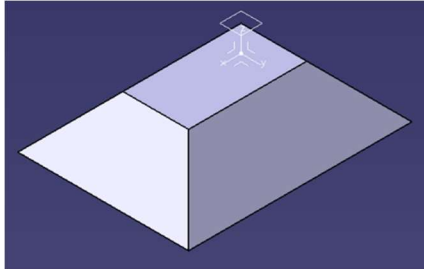
(f) Through point and line

(g) Circle/Sphere

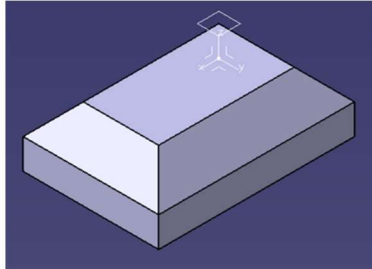
(h) Offset from plane

(i) Point-Direction

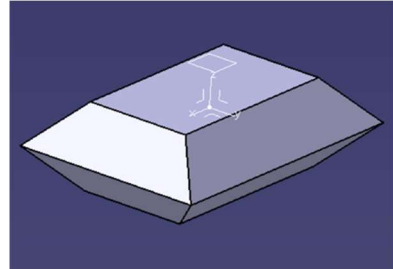
10. (각 2점)



(1)

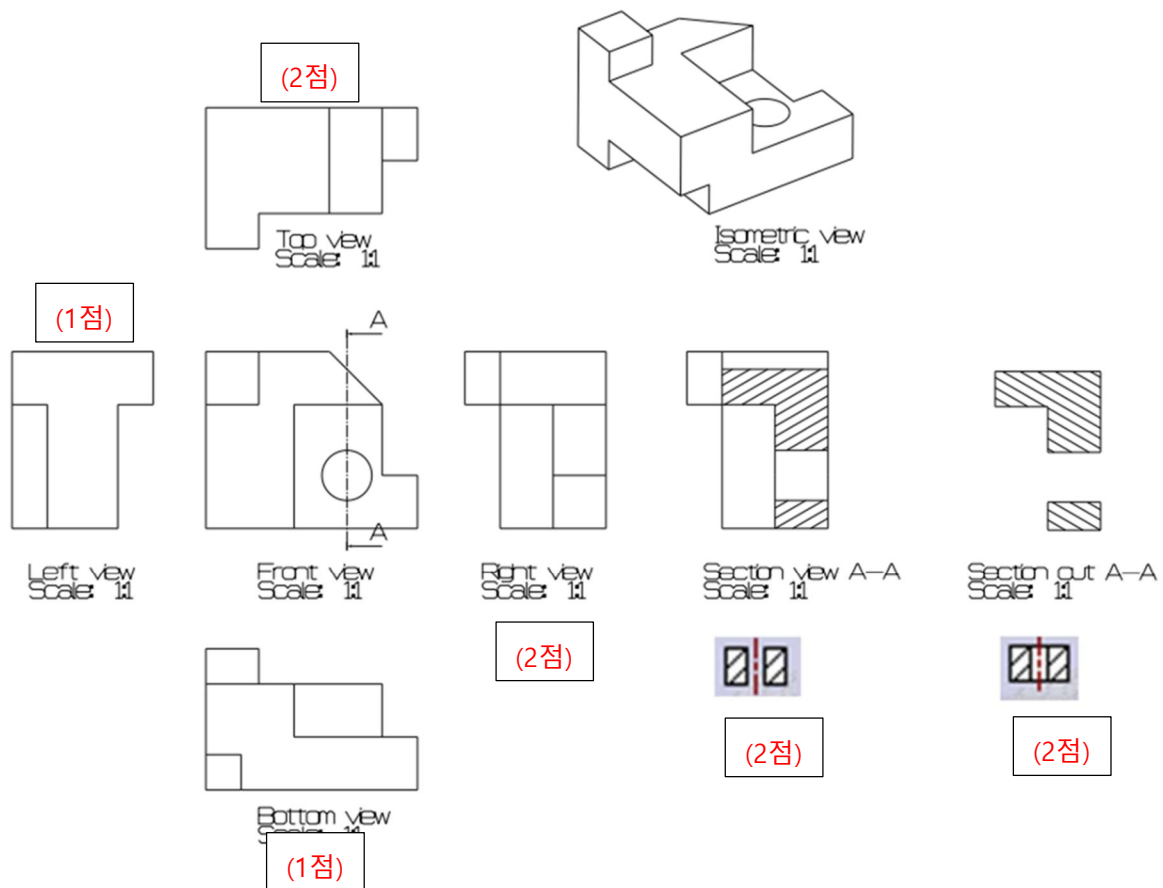


(2)



(3)

11. (10점: 6개)



12. (각 2점)

(1) - (d)

(2) - (c)

(3) - (e)

(4) - (a)

(5) - (b)