

	<hr style="width: 50%; margin: 0 auto;"/>		<hr style="width: 50%; margin: 0 auto;"/>
.	.	60	20
.	.	.	-1
.	.	.	-2
.	.	.30	-3
.	.	.	-4
.	.	.	-5
.	.	()	-6
:	:	:	:
		30	=

	A	B	C	D	E
1-	0	0	0	0	0
2-	0	0	0	0	0
3-	0	0	0	0	0
4-	0	0	0	0	0
5-	0	0	0	0	0

6-	0	0	0	0	0
7-	0	0	0	0	0
8-	0	0	0	0	0
9-	0	0	0	0	0
10-	0	0	0	0	0

11-	0	0	0	0	0
12-	0	0	0	0	0
13-	0	0	0	0	0
14-	0	0	0	0	0
15-	0	0	0	0	0

16-	0	0	0	0	0
17-	0	0	0	0	0
18-	0	0	0	0	0
19-	0	0	0	0	0
20-	0	0	0	0	0

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 1 & 3 \end{pmatrix}$$

$$\begin{array}{l} : \quad A \quad -1 \\ (13)(2) \mathbf{D} \quad (1)(23) \quad -\mathbf{C} \quad (1)(2)(3) \quad -\mathbf{B} \quad * \quad (12)(3) \quad -\mathbf{A} \\ \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad (123) \quad -\mathbf{E} \end{array}$$

$$: \quad B = A^{-1} \quad -2$$

$$\begin{array}{l} \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}; \quad -\mathbf{C} \quad \begin{pmatrix} 1 & 2 & 3 \\ 1 & 3 & 2 \end{pmatrix} \quad -\mathbf{B} \quad \begin{pmatrix} 1 & 2 & 3 \\ 3 & 1 & 2 \end{pmatrix} \quad -\mathbf{A} \\ * \quad \begin{pmatrix} 1 & 2 & 3 \\ 2 & 1 & 3 \end{pmatrix} \quad -\mathbf{E} \quad p_1 = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix} \quad -\mathbf{D} \end{array}$$

$$: \quad A \quad -3$$

$$\begin{array}{l} (13)(2) \mathbf{D} \quad (1)(23) \quad -\mathbf{C} \quad (1)(2)(3) \quad -\mathbf{B} \quad * \quad (12)(3) \quad -\mathbf{A} \\ \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad (123) \quad -\mathbf{E} \end{array}$$

$$: \quad C = (AB)^{-1} \quad -4$$

$$\begin{array}{l} \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}; \quad -\mathbf{C} \quad \begin{pmatrix} 1 & 2 & 3 \\ 1 & 3 & 2 \end{pmatrix} \quad -\mathbf{B} \quad \begin{pmatrix} 1 & 2 & 3 \\ 3 & 1 & 2 \end{pmatrix} \quad -\mathbf{A} \\ * \quad \begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix} \quad -\mathbf{E} \quad p_1 = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix} \quad -\mathbf{D} \end{array}$$

$$: \quad C = (AB)^{-1} \quad -5$$

$$\begin{array}{l} (13)(2) \mathbf{D} \quad (1)(23) \quad -\mathbf{C} \quad (1)(2)(3) \quad -\mathbf{B} \quad (12)(3) \quad -\mathbf{A} \\ \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad * \quad (123) \quad -\mathbf{E} \end{array}$$

$$: \quad A \quad -6$$

$$\begin{array}{l} \begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad -\mathbf{C} \quad * \quad \begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad -\mathbf{B} \quad \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad -\mathbf{A} \\ \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix} \quad -\mathbf{E} \quad \begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix} \quad -\mathbf{D} \end{array}$$

C_{3v}	E	c_3	c_3^2	σ_a	σ_b	σ_c
E	E	c_3	c_3^2	σ_a	σ_b	σ_c
c_3	c_3	c_3^2	E	σ_c	σ_a	σ_b
c_3^2	c_3^2	E	c_3	σ_b	σ_c	σ_a
σ_a	C	σ_b	σ_c	E	c_3	B
σ_b	σ_b	σ_c	σ_a	c_3^2	E	c_3
σ_c	σ_c	σ_a	σ_b	c_3	c_3^2	E

9 7

: **B** - 7

- A c_3^{2*} ;
- B c_3 ,
- C σ_a ;
- D σ_b ;
- E E

: **C** - 8

- A σ_a^* ;
- B c_3 ,
- C c_3^2 ;
- D σ_b ;
- E E

: **B⁻¹CB** - 9

- A σ_b^* ;
 - B c_3 ,
 - C c_3^2 ;
 - D σ_c ;
 - E E
-
-

$$A \quad E, C_\infty, C_2, \sigma_h \quad *$$

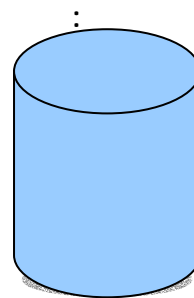
$$B \quad E, C_\infty, C_2, \sigma_h$$

$$C \quad E, C_4, C_2, \sigma_v$$

$$D \quad E, C_\infty, C_2, S_3$$

$$E \quad E, C_2^2, C_2, \sigma_h$$

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- 10

$$: \begin{pmatrix} 1 & 2 \\ 3 & 5 \end{pmatrix}$$

-11

$$A \quad \begin{pmatrix} -5 & 2 \\ 3 & -1 \end{pmatrix} \quad *$$

$$B \quad \begin{pmatrix} 5 & 2 \\ 3 & -1 \end{pmatrix}$$

$$C \quad \begin{pmatrix} -5 & 2 \\ 3 & 1 \end{pmatrix}$$

$$D \quad \begin{pmatrix} -5 & -2 \\ 3 & -1 \end{pmatrix}$$

$$E \quad \begin{pmatrix} 5 & 2 \\ 3 & 1 \end{pmatrix}$$

=====

:

z

C_2

-12

$$A \quad \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \quad *$$

$$B \quad \begin{pmatrix} 5 & 2 \\ 3 & -1 \end{pmatrix}$$

$$C \quad \begin{pmatrix} -5 & 2 \\ 3 & 1 \end{pmatrix}$$

$$D \quad \begin{pmatrix} -5 & -2 \\ 3 & -1 \end{pmatrix}$$

$$E \quad \begin{pmatrix} 5 & 2 \\ 3 & 1 \end{pmatrix}$$

14 13

$$A = \begin{pmatrix} 5 & 4 \\ 1 & 2 \end{pmatrix}$$

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: A - 13

- A 1, 6 *
- B 2, 3
- C 1, 3
- D 2, 4
- E 3, 6

=====

:

A - 14

$$A \begin{pmatrix} 1 & -4 \\ 1 & 1 \end{pmatrix} *$$

$$B \begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$$

$$C \begin{pmatrix} 2 & 3 \\ 3 & 2 \end{pmatrix}$$

$$D \begin{pmatrix} 2 & 0 \\ 0 & -1 \end{pmatrix}$$

$$E \begin{pmatrix} 2 & 0 \\ 0 & 3 \end{pmatrix}$$

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:

-15

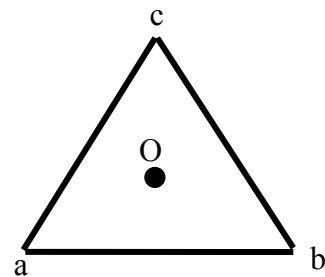
$$A \{E, c_3, c_3^2\} *$$

$$B \{E, c_3, i\} *$$

$$C \{E, c_3, \sigma_h\}$$

$$D \{E, \sigma_h, i\}$$

$$E \{E, \sigma_h, \sigma_a\}$$



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:

- 16

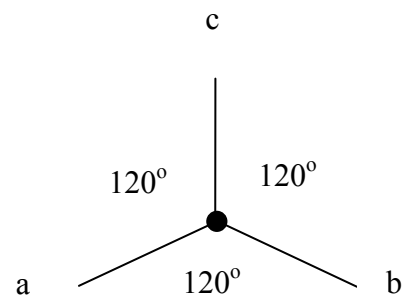
$$A \{E, c_3, c_3^2, \sigma_a, \sigma_b, \sigma_c\} *$$

$$B \{E, c_3, c_3^2, \sigma_b, \sigma_b, \sigma_c\}$$

$$C \{E, c_3, c_3^2, \sigma_a, \sigma_c, \sigma_c\}$$

$$D \{E, c_3, c_3^2, \sigma_a, \sigma_b, \sigma_c\}$$

$$E \{E, c_2, c_3^2, \sigma_a, \sigma_b, \sigma_c\}$$



$$(G, \circ) \quad x \neq 0 \quad f_4 = \frac{x-1}{x} \quad f_2 = \frac{1}{x} \quad - 17$$

$$(f_2 \circ f_4)(x) \quad \cdot f, g \in G \quad (f \circ g)(x) = f(g(x))$$

$$A \quad \frac{x}{x-1} *$$

$$B \quad \frac{x-1}{x}$$

$$C \quad x-1$$

$$D \quad x^2$$

$$E \quad 1/x$$

: -18

$$\cdot A = \begin{pmatrix} 1 & 2 \\ 1 & 0 \end{pmatrix}, \quad B = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$A \quad \begin{pmatrix} 1 & 2 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} *$$

: - 19

$$: A = \begin{pmatrix} 1 & 2 \\ 1 & 0 \end{pmatrix}, \quad B = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$A \quad \begin{pmatrix} 1 & 0 & 2 & 0 \\ 0 & 1 & 0 & 2 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix} *$$

$$,C = \frac{1}{2} \begin{pmatrix} -1 & \sqrt{3} \\ \sqrt{3} & 1 \end{pmatrix}, B = \frac{1}{2} \begin{pmatrix} -1 & \sqrt{3} \\ \sqrt{3} & 1 \end{pmatrix}, A = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \quad \text{-20}$$

$$: \quad .E = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}, F = \frac{1}{2} \begin{pmatrix} -1 & -\sqrt{3} \\ \sqrt{3} & -1 \end{pmatrix}, D = \frac{1}{2} \begin{pmatrix} -1 & \sqrt{3} \\ -\sqrt{3} & -1 \end{pmatrix}$$

$$A \quad (E);(A,B,C);(D,F) \quad *$$

$$B \quad (E);(A,B,F);(D,C)$$

$$C \quad (E);(D,B,C);(E,F)$$

$$D \quad (E);(B,C);(A,D,F)$$

$$E \quad (E);(A,B,C,D,F)$$