

Table 1.3: The Multiplication Table for the

b

Orientation Congruent Algebra \mathcal{OC}_5

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$a \circ b$	1	e_1	e_2	e_3	e_4	e_5	e_{34}	e_{25}	e_{45}	e_{31}	e_{51}	e_{42}	e_{12}	e_{53}	e_{23}	e_{14}	e_{235}	e_{145}	e_{124}	e_{345}	e_{135}	e_{234}	e_{245}	e_{123}	e_{134}	e_{125}	e_{1234}	e_{1253}	e_{1245}	e_{3145}	e_{2345}	Ω		
1	1	e_1	e_2	e_3	e_4	e_5	e_{34}	e_{25}	e_{45}	e_{31}	e_{51}	e_{42}	e_{12}	e_{53}	e_{23}	e_{14}	e_{235}	e_{145}	e_{124}	e_{345}	e_{135}	e_{234}	e_{245}	e_{123}	e_{134}	e_{125}	e_{1234}	e_{1253}	e_{1245}	e_{3145}	e_{2345}	Ω		
e_1	e_1	1	e_{12}	$-e_{31}$	e_{14}	$-e_{51}$	e_{134}	e_{125}	e_{145}	e_3	e_5	$-e_{124}$	$-e_2$	$-e_{135}$	e_{123}	$-e_4$	$-e_{1253}$	e_{45}	$-e_{42}$	$-e_{3145}$	$-e_{53}$	e_{1234}	e_{1245}	e_{23}	e_{34}	e_{25}	$-e_{234}$	e_{235}	$-e_{245}$	e_{345}	Ω	e_{2345}		
e_2	e_2	$-e_{12}$	1	e_{23}	$-e_{42}$	e_{25}	e_{234}	$-e_5$	e_{245}	e_{123}	e_{125}	e_4	e_1	$-e_{235}$	$-e_3$	$-e_{124}$	$-e_{53}$	$-e_{1245}$	$-e_{14}$	e_{2345}	e_{1253}	e_{34}	e_{45}	e_{31}	$-e_{1234}$	e_{51}	e_{134}	$-e_{135}$	e_{145}	Ω	$-e_{345}$	e_{3145}		
e_3	e_3	e_{31}	$-e_{23}$	1	e_{34}	$-e_{53}$	$-e_4$	$-e_{235}$	e_{345}	$-e_1$	e_{135}	e_{234}	e_{123}	e_5	e_2	$-e_{134}$	$-e_{25}$	e_{3145}	e_{1234}	e_{45}	e_{51}	e_{42}	$-e_{2345}$	e_{12}	$-e_{14}$	$-e_{1253}$	$-e_{124}$	e_{125}	Ω	$-e_{145}$	e_{245}	e_{1245}		
e_4	e_4	$-e_{14}$	e_{42}	$-e_{34}$	1	e_{45}	e_3	$-e_{245}$	$-e_5$	$-e_{134}$	e_{145}	$-e_2$	e_{124}	e_{345}	e_{234}	e_1	e_{2345}	e_{51}	e_{12}	e_{53}	$-e_{3145}$	e_{23}	$-e_{25}$	$-e_{1234}$	$-e_{31}$	e_{1245}	e_{123}	Ω	$-e_{125}$	e_{135}	$-e_{235}$	e_{1253}		
e_5	e_5	e_{51}	$-e_{25}$	e_{53}	$-e_{45}$	1	e_{345}	e_2	e_4	$-e_{135}$	$-e_1$	$-e_{245}$	e_{125}	$-e_3$	e_{235}	e_{145}	e_{23}	e_{14}	$-e_{1245}$	e_{34}	$-e_{31}$	$-e_{2345}$	$-e_{42}$	e_{1253}	e_{3145}	e_{12}	Ω	$-e_{123}$	e_{124}	$-e_{134}$	e_{234}	e_{1234}		
e_{34}	e_{34}	e_{134}	e_{234}	e_4	$-e_3$	e_{345}	1	e_{2345}	e_{53}	$-e_{14}$	e_{3145}	e_{23}	e_{1234}	$-e_{45}$	$-e_{42}$	e_{31}	e_{245}	$-e_{135}$	$-e_{123}$	e_5	e_{145}	e_2	$-e_{235}$	e_{124}	e_1	Ω	e_{12}	$-e_{1245}$	e_{1253}	e_{51}	e_{25}	e_{125}		
e_{25}	e_{25}	e_{125}	e_5	$-e_{235}$	$-e_{245}$	$-e_2$	e_{2345}	1	$-e_{42}$	$-e_{1253}$	e_{12}	e_{45}	$-e_{51}$	$-e_{23}$	e_{53}	$-e_{1245}$	$-e_3$	e_{124}	$-e_{145}$	$-e_{234}$	e_{123}	e_{345}	$-e_4$	$-e_{135}$	Ω	e_1	$-e_{3145}$	$-e_{31}$	$-e_{14}$	e_{1234}	e_{34}	e_{134}		
e_{45}	e_{45}	e_{145}	e_{245}	e_{345}	e_5	$-e_4$	$-e_{53}$	e_{42}	1	e_{3145}	e_{14}	$-e_{25}$	e_{1245}	e_{34}	e_{2345}	$-e_{51}$	$-e_{234}$	e_1	e_{125}	e_3	$-e_{134}$	e_{235}	e_2	Ω	e_{135}	$-e_{124}$	$-e_{1253}$	e_{1234}	e_{12}	e_{31}	e_{23}	e_{123}		
e_{31}	e_{31}	$-e_3$	e_{123}	e_1	$-e_{134}$	$-e_{135}$	e_{14}	$-e_{1253}$	e_{3145}	1	$-e_{53}$	$-e_{1234}$	e_{23}	e_{51}	$-e_{12}$	$-e_{34}$	$-e_{125}$	$-e_{345}$	e_{234}	e_{145}	$-e_5$	$-e_{124}$	Ω	e_2	$-e_4$	e_{235}	$-e_{42}$	$-e_{25}$	e_{2345}	e_{45}	$-e_{1245}$	e_{245}		
e_{51}	e_{51}	$-e_5$	e_{125}	e_{135}	e_{145}	e_1	e_{3145}	$-e_{12}$	$-e_{14}$	e_{53}	1	e_{1245}	e_{25}	$-e_{31}$	e_{1253}	e_{45}	e_{123}	e_4	$-e_{245}$	e_{134}	e_3	Ω	e_{124}	$-e_{235}$	$-e_{345}$	e_2	e_{2345}	e_{23}	e_{42}	e_{34}	$-e_{1234}$	e_{234}		
e_{42}	e_{42}	$-e_{124}$	$-e_4$	e_{234}	e_2	$-e_{245}$	$-e_{23}$	$-e_{45}$	e_{25}	$-e_{1234}$	e_{1245}	1	$-e_{14}$	$-e_{2345}$	e_{34}	e_{12}	e_{345}	e_{125}	$-e_1$	$-e_{235}$	Ω	e_3	$-e_5$	e_{134}	$-e_{123}$	$-e_{145}$	$-e_{31}$	e_{3145}	e_{51}	$-e_{1253}$	$-e_{53}$	e_{135}		
e_{12}	e_{12}	e_2	$-e_1$	e_{123}	e_{124}	e_{125}	e_{1234}	e_{51}	e_{1245}	$-e_{23}$	$-e_{25}$	e_{14}	1	e_{1253}	e_{31}	$-e_{42}$	$-e_{135}$	e_{245}	e_4	Ω	e_{235}	$-e_{134}$	$-e_{145}$	e_3	e_{234}	e_5	e_{34}	e_{53}	e_{45}	$-e_{2345}$	e_{3145}	e_{345}		
e_{53}	e_{53}	$-e_{135}$	$-e_{235}$	$-e_5$	e_{345}	e_3	e_{45}	e_{23}	$-e_{34}$	$-e_{51}$	e_{31}	$-e_{2345}$	e_{1253}	1	$-e_{25}$	$-e_{3145}$	$-e_2$	$-e_{134}$	Ω	e_4	$-e_1$	e_{245}	$-e_{234}$	$-e_{125}$	e_{145}	e_{123}	e_{1245}	e_{12}	$-e_{1234}$	$-e_{14}$	$-e_{42}$	e_{124}		
e_{23}	e_{23}	e_{123}	e_3	$-e_2$	e_{234}	e_{235}	e_{42}	$-e_{53}$	e_{2345}	e_{12}	e_{1253}	$-e_{34}$	$-e_{31}$	e_{25}	1	e_{1234}	e_5	Ω	e_{134}	$-e_{245}$	$-e_{125}$	e_4	e_{345}	e_1	$-e_{124}$	e_{135}	e_{14}	e_{51}	$-e_{3145}$	e_{1245}	e_{45}	e_{145}		
e_{14}	e_{14}	e_4	$-e_{124}$	$-e_{134}$	$-e_1$	e_{145}	$-e_{31}$	$-e_{1245}$	e_{51}	e_{34}	$-e_{45}$	$-e_{12}$	e_{42}	$-e_{3145}$	e_{1234}	1	Ω	e_5	$-e_2$	e_{135}	$-e_{345}$	$-e_{123}$	e_{125}	e_{234}	$-e_3$	$-e_{245}$	e_{23}	$-e_{2345}$	$-e_{25}$	$-e_{53}$	e_{1253}	e_{235}		
e_{235}	e_{235}	e_{1253}	$-e_{53}$	$-e_{25}$	$-e_{2345}$	e_{23}	$-e_{245}$	$-e_3$	e_{234}	e_{125}	$-e_{123}$	$-e_{345}$	e_{135}	$-e_2$	e_5	Ω	1	e_{1234}	$-e_{3145}$	e_{42}	$-e_{12}$	$-e_{45}$	e_{34}	e_{51}	$-e_{1245}$	$-e_{31}$	e_{145}	$-e_1$	$-e_{134}$	$-e_{124}$	e_4	e_{14}		
e_{145}	e_{145}	e_{45}	e_{1245}	$-e_{3145}$	e_{51}	e_{14}	e_{135}	$-e_{124}$	e_1	e_{345}	e_4	$-e_{125}$	$-e_{245}$	e_{134}	Ω	e_5	e_{1234}	1	e_{25}	$-e_{31}$	$-e_{34}$	e_{1253}	e_{12}	e_{2345}	$-e_{53}$	e_{42}	e_{235}	e_{234}	$-e_2$	e_3	e_{123}	e_{23}		
e_{124}	e_{124}	$-e_{42}$	$-e_{14}$	$-e_{1234}$	e_{12}	e_{1245}	e_{123}	e_{145}	$-e_{125}$	$-e_{234}$	e_{245}	$-e_1$	e_4	Ω	$-e_{134}$	$-e_2$	$-e_{3145}$	$-e_{25}$	1	e_{1253}	$-e_{2345}$	e_{31}	$-e_{51}$	$-e_{34}$	e_{23}	e_{45}	e_3	e_{345}	$-e_5$	$-e_{235}$	$-e_{135}$	e_{53}		
e_{345}	e_{345}	e_{3145}	$-e_{2345}$	e_{45}	e_{53}	e_{34}	e_5	e_{234}	e_3	$-e_{145}$	$-e_{134}$	e_{235}	Ω	e_4	e_{245}	$-e_{135}$	$-e_{42}$	e_{31}	e_{1253}	1	e_{14}	$-e_{25}$	$-e_{23}$	e_{1245}	e_{51}	e_{1234}	e_{125}	e_{124}	e_{123}	$-e_1$	e_2	e_{12}		
e_{135}	e_{135}	$-e_{53}$	$-e_{1253}$	e_{51}	e_{3145}	$-e_{31}$	$-e_{145}$	$-e_{123}$	e_{134}	$-e_5$	e_3	Ω	$-e_{235}$	$-e_1$	e_{125}	e_{345}	e_{12}	e_{34}	$-e_{2345}$	$-e_{14}$	1	e_{1245}	$-e_{1234}$	e_{25}	$-e_{45}$	$-e_{23}$	$-e_{245}$	$-e_{23}$	$-e_{245}$	e_2	e_{234}	$-e_4$	$-e_{124}$	e_{42}
e_{234}	e_{234}	$-e_{1234}$	e_{34}	e_{42}	e_{23}	e_{2345}	e_2	$-e_{345}$	$-e_{235}$	e_{124}	Ω	e_3	e_{134}	$-e_{245}$	e_4	e_{123}	e_{45}	e_{1253}	$-e_{31}$	e_{25}	e_{1245}	1	e_{53}	$-e_{14}$	$-e_{12}$	e_{3145}	e_1	e_{145}	e_{135}	e_{125}	$-e_5$	e_{51}		
e_{245}	e_{245}	$-e_{1245}$	e_{45}	e_{2345}	$-e_{25}$	$-e_{42}$	e_{235}	$-e_4$	e_2	Ω	$-e_{124}$	$-e_5$	e_{145}	e_{234}	$-e_{345}$	$-e_{125}$	$-e_{34}$	$-e_{12}$	e_{51}	e_{23}	$-e_{1234}$	$-e_{53}$	1	e_{3145}	$-e_{1253}$	e_{14}	$-e_{135}$	$-e_{134}$	e_1	e_{123}	$-e_3$	e_{31}		
e_{123}	e_{123}	e_{23}	e_{31}	e_{12}	e_{1234}	$-e_{1253}$	$-e_{124}$	e_{135}	Ω	e_2	e_{235}	$-e_{134}$	e_3	e_{125}	e_1	$-e_{234}$	$-e_{51}$	e_{2345}	e_{34}	e_{1245}	$-e_{25}$	e_{14}	e_{3145}	1	e_{42}	$-e_{53}$	$-e_4$	e_5	e_{345}	e_{245}	e_{145}	e_{45}		
e_{134}	e_{134}	e_{34}	e_{1234}	$-e_{14}$	$-e_{31}$	$-e_{3145}$	e_1	Ω	$-e_{135}$	$-e_4$	e_{345}	e_{123}	$-e_{234}$	$-e_{145}$	e_{124}	$-e_3$	$-e_{1245}$	e_{53}	$-e_{23}$	$-e_{51}$	e_{45}	e_{12}	$-e_{1253}$	$-e_{42}$	1	e_{2345}	$-e_2$	$-e_{245}$	$-e_{235}$	e_5	e_{125}	e_{25}		
e_{125}	e_{125}	e_{25}	e_{51}	e_{1253}	$-e_{1245}$	e_{12}	Ω	e_1	e_{124}	$-e_{235}$	e_2	e_{145}	e_5	$-e_{123}$	$-e_{135}$	e_{245}	e_{31}	$-e_{42}$	$-e_{45}$	e_{1234}	e_{23}	e_{3145}												