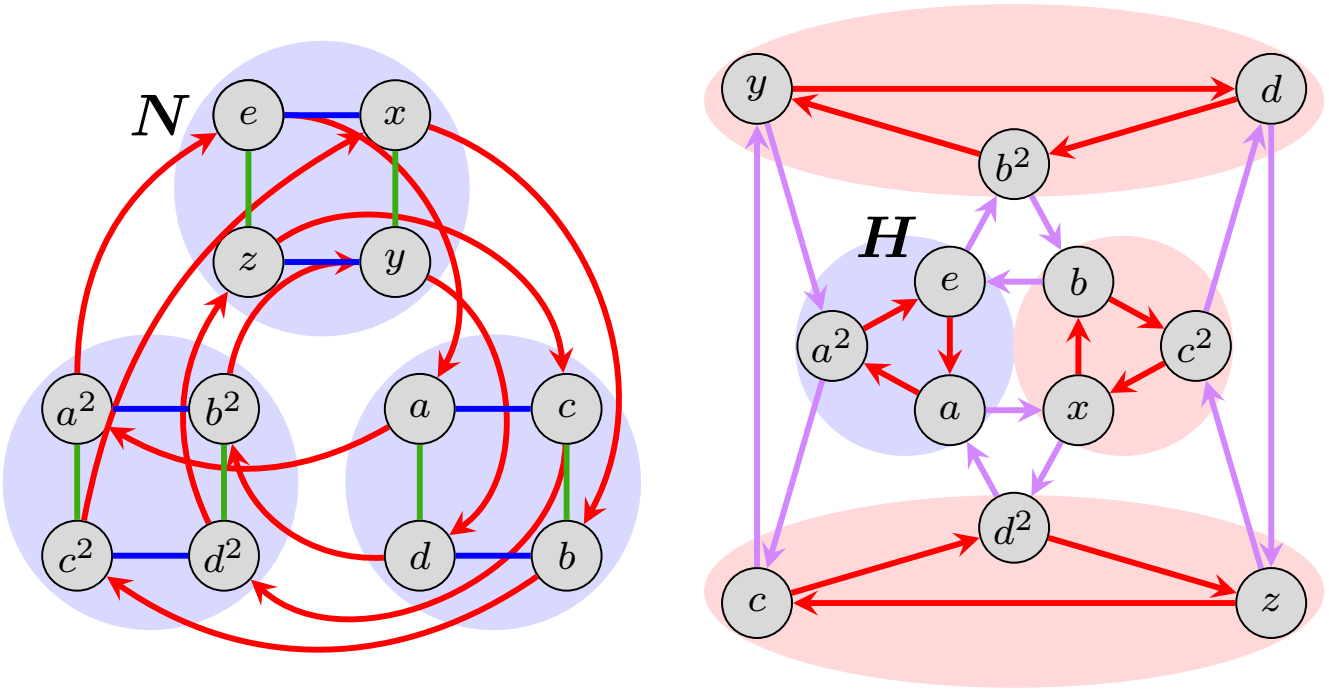
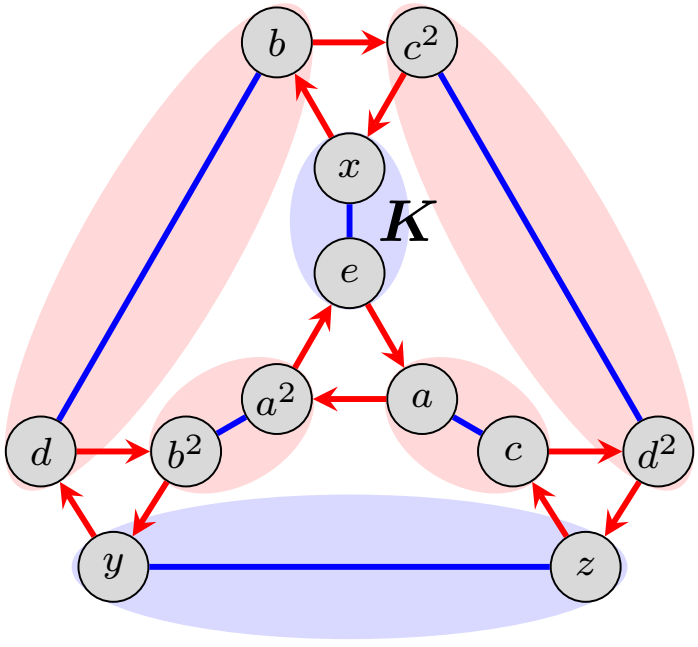
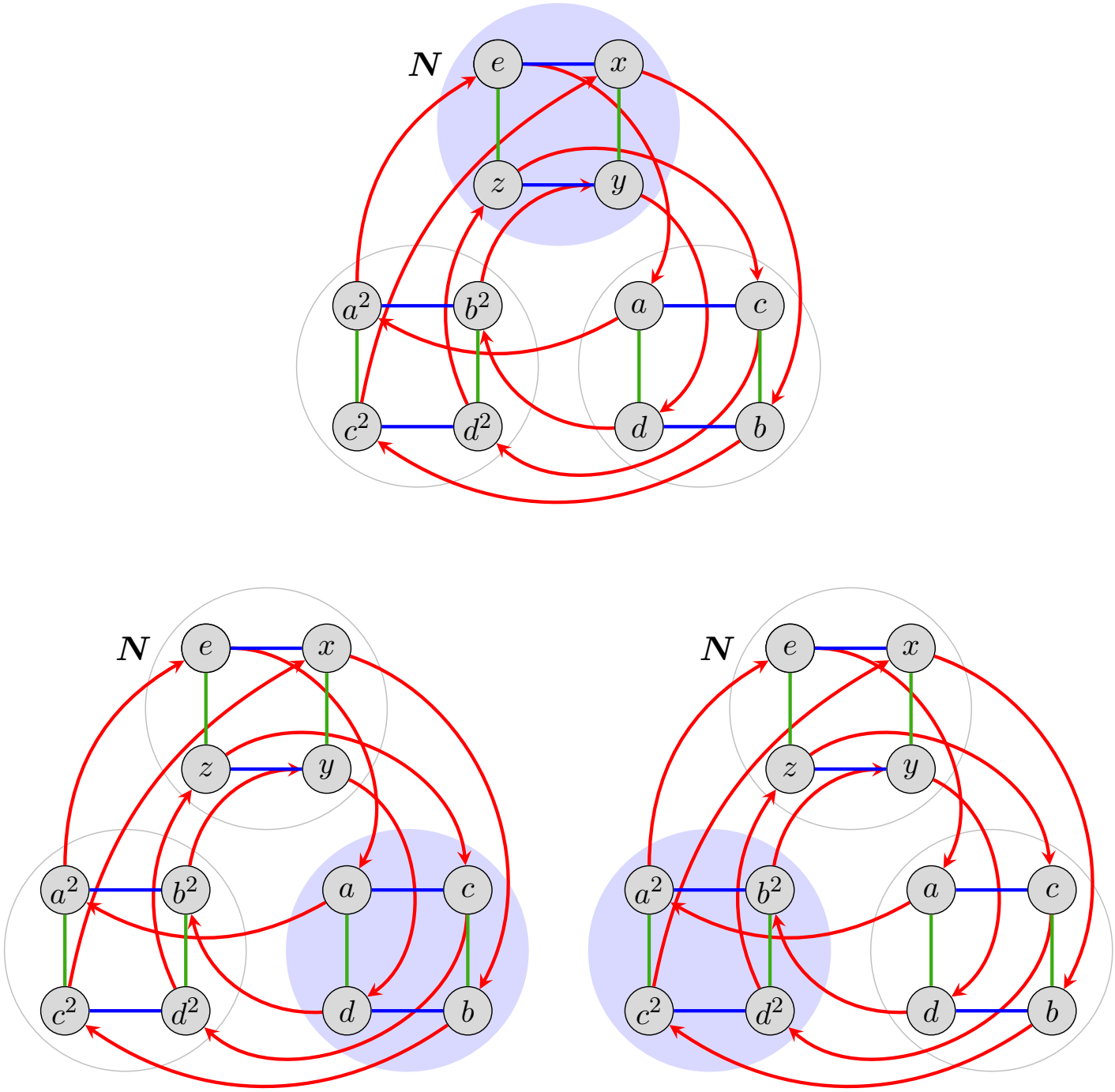
Supplemental material: Visual Algebra (Math 4120), HW 6

#1(a): Partitions of A_4 by the right cosets of three of its subgroups.

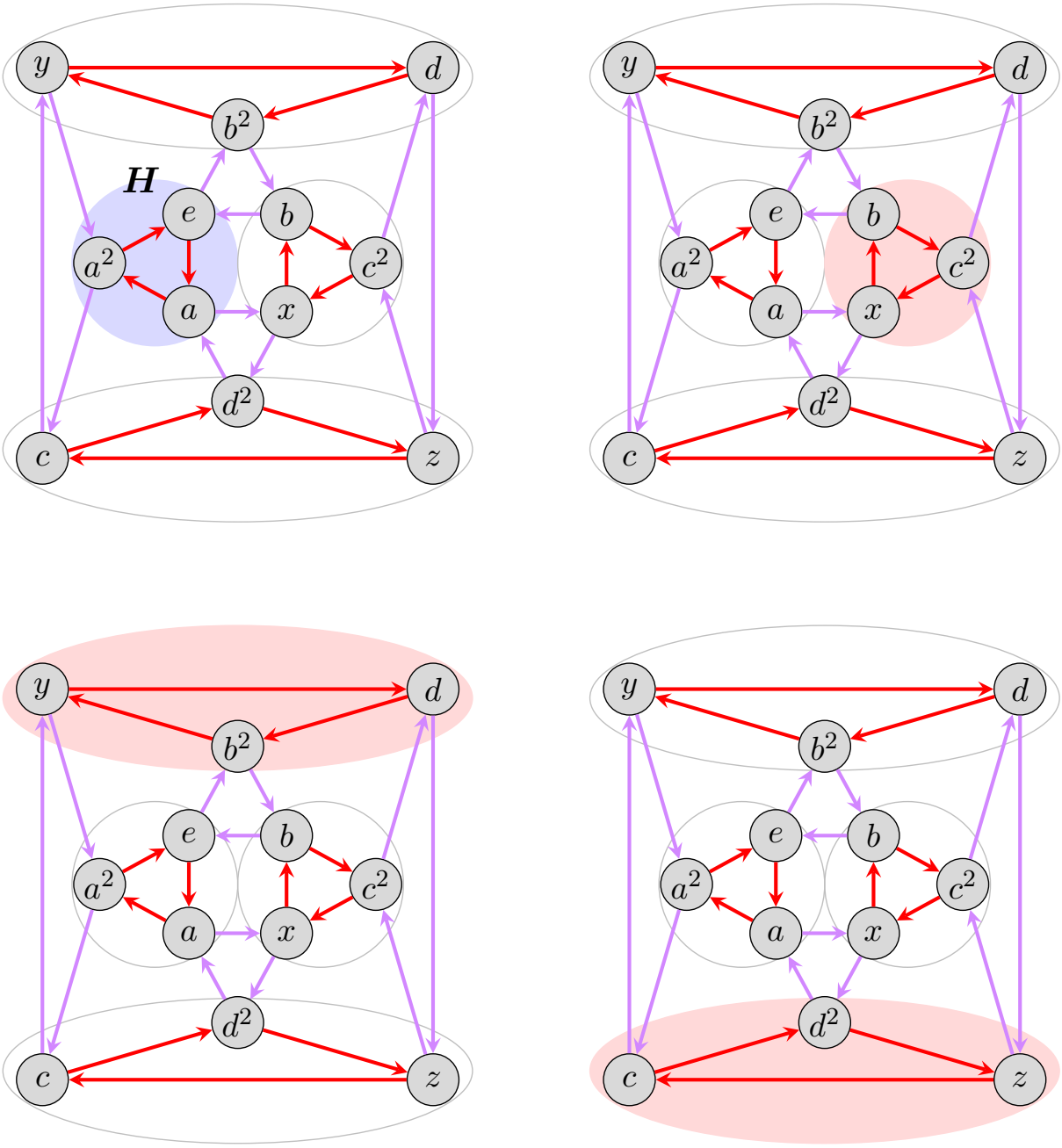




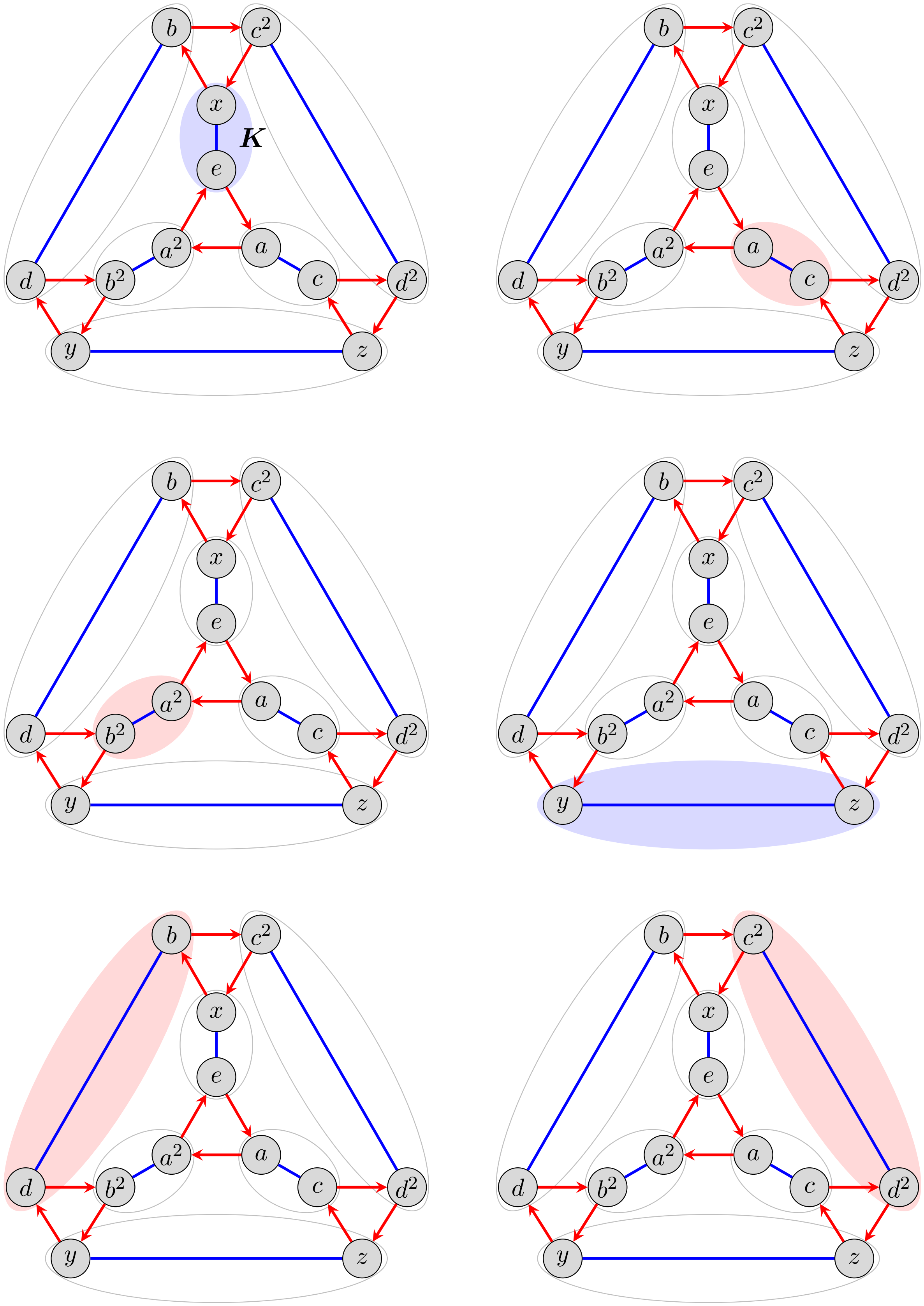
#**1(b)**: Each left coset gN defines a conjugate subgroup $gNg^{-1} \leq A_4$.



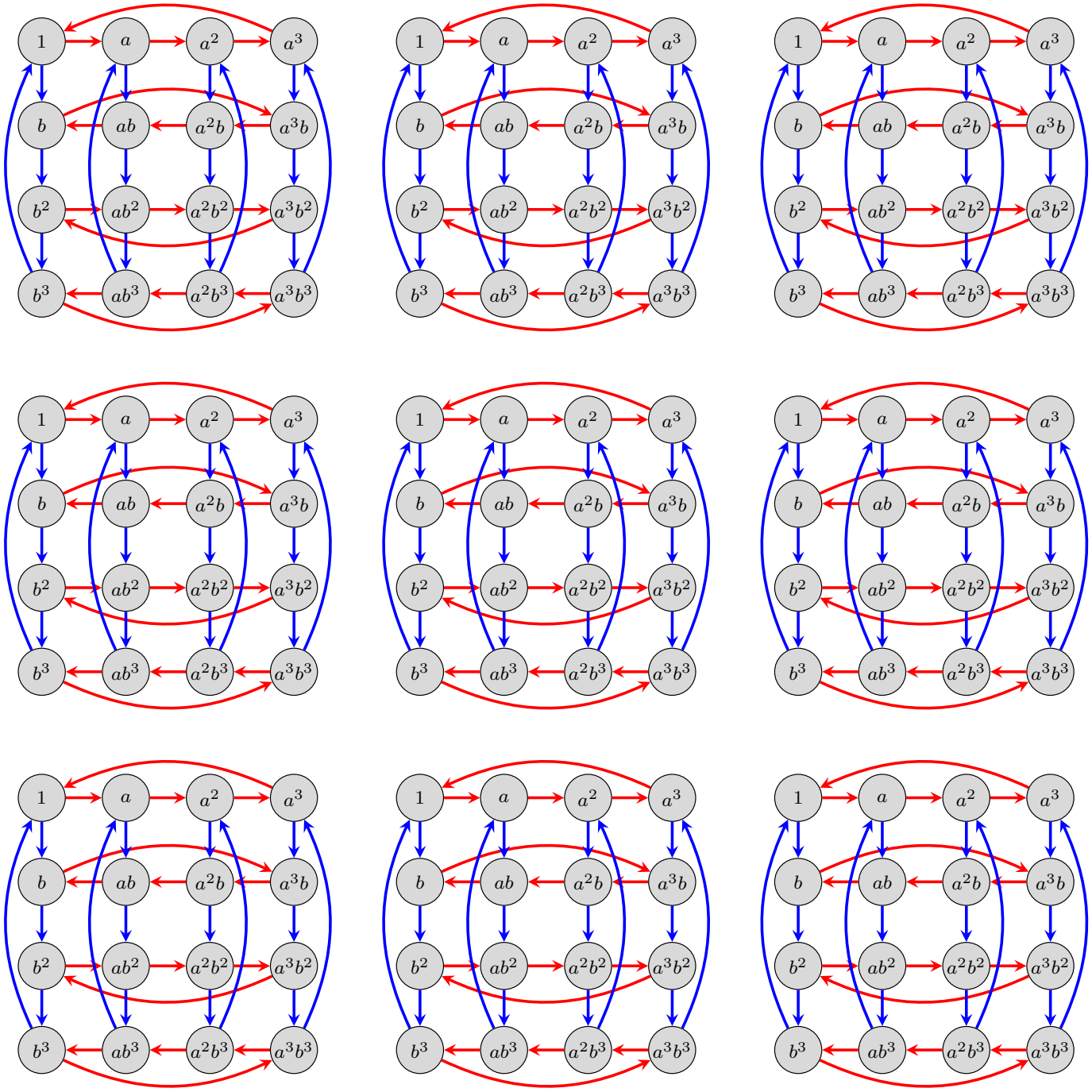
#**1(b)**: Each left coset gH defines a conjugate subgroup $gHg^{-1} \leq A_4$.



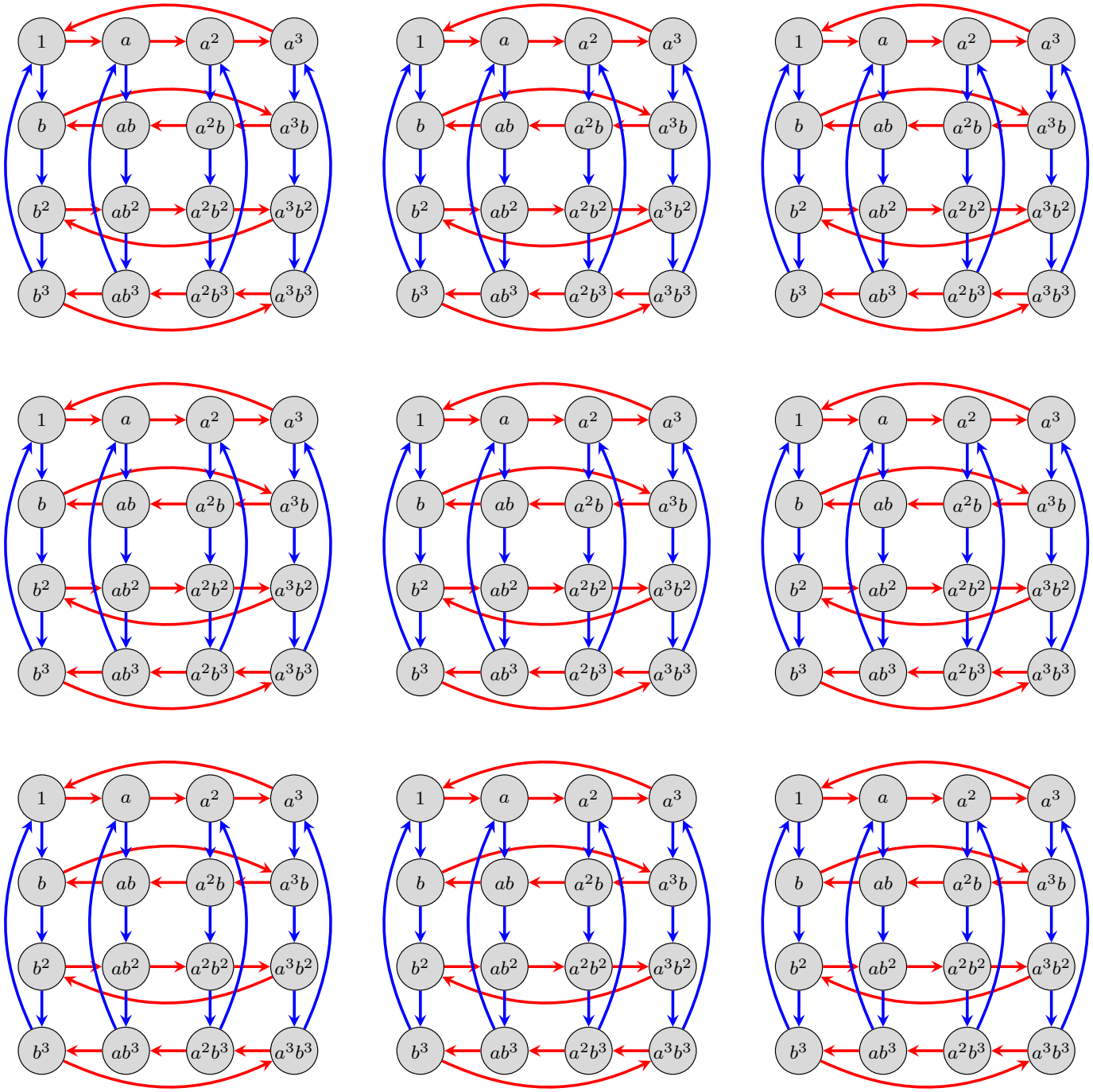
$\#\mathbf{1(b)}$: Each left coset gK defines a conjugate subgroup $gKg^{-1} \leq A_4$.



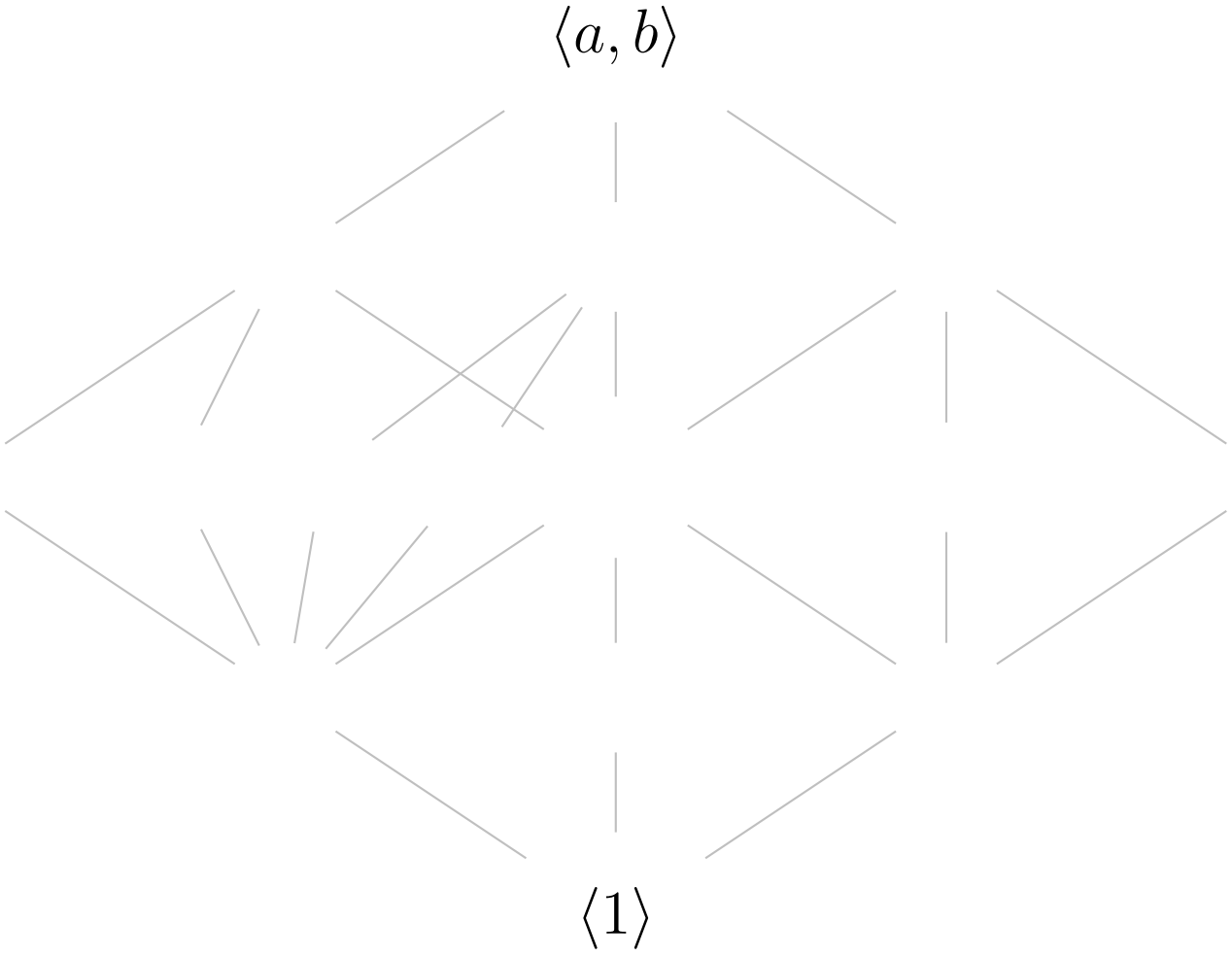
#**4(a)**: Three-step construction of the conjugate subgroups of $H = \langle ab \rangle$ in $C_4 \rtimes C_4$: the subgroup H (left), the left coset xH (middle), and the conjugate subgroup xHx^{-1} (right).



#**4(a)**: Three-step construction of the conjugate subgroups of $K = \langle a^2, b^2 \rangle$ in $C_4 \rtimes C_4$: the subgroup K (left), the left coset xK (middle), and the conjugate subgroup xKx^{-1} (right).



#**4(b)**: The subgroup lattice of $C_4 \rtimes C_4 = \langle a, b \rangle$, with the subgroups written by generator(s).



#**4(e)**: Cayley table of the quotient of $C_4 \rtimes C_4$ by the subgroup $\langle a^2 \rangle$.

	± 1	$\pm b$	$\pm b^2$	$\pm b^3$	$\pm a$	$\pm ab$	$\pm ab^2$	$\pm ab^3$
± 1								
$\pm b$								
$\pm b^2$								
$\pm b^3$								
$\pm a$								
$\pm ab$								
$\pm ab^2$								
$\pm ab^3$								

#**4(e)**: Cayley table of the quotient of $C_4 \rtimes C_4$ by the subgroup $\langle b^2 \rangle$.

	± 1	$\pm a$	$\pm a^2$	$\pm a^3$	$\pm b$	$\pm ab$	$\pm a^2 b$	$\pm a^3 b$
± 1								
$\pm a$								
$\pm a^2$								
$\pm a^3$								
$\pm b$								
$\pm ab$								
$\pm a^2 b$								
$\pm a^3 b$								

#**4(e)**: Cayley table of the quotient of $C_4 \rtimes C_4$ by the subgroup $\langle a^2b^2 \rangle$.

	± 1	$\pm a$	$\pm a^2$	$\pm a^3$	$\pm b$	$\pm ab$	$\pm a^2b$	$\pm a^3b$
± 1								
$\pm a$								
$\pm a^2$								
$\pm a^3$								
$\pm b$								
$\pm ab$								
$\pm a^2b$								
$\pm a^3b$								