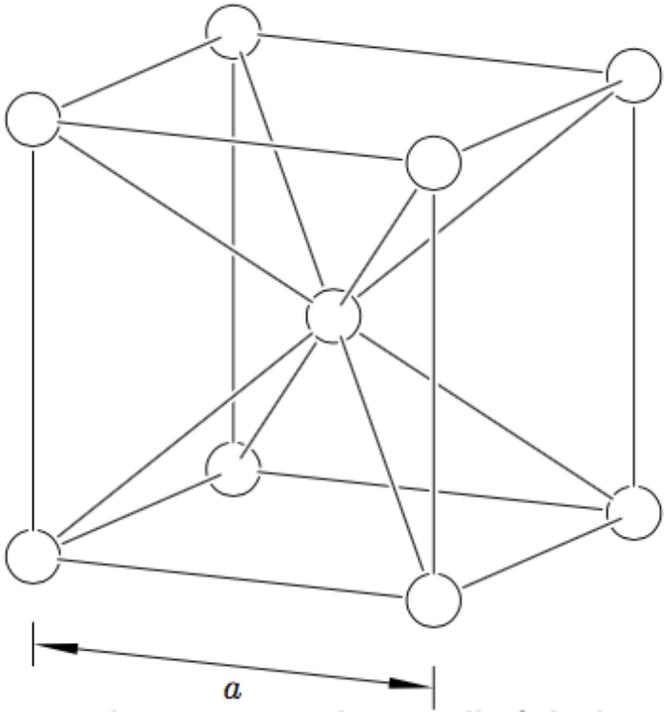
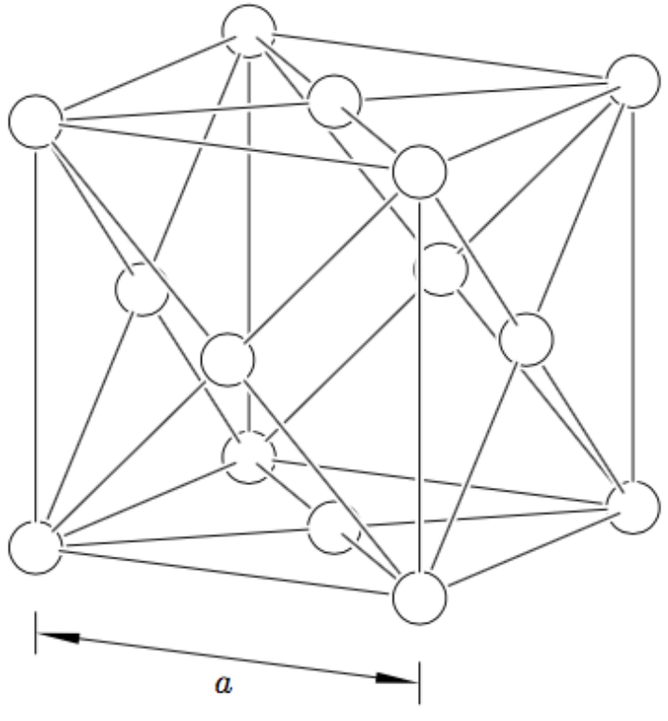
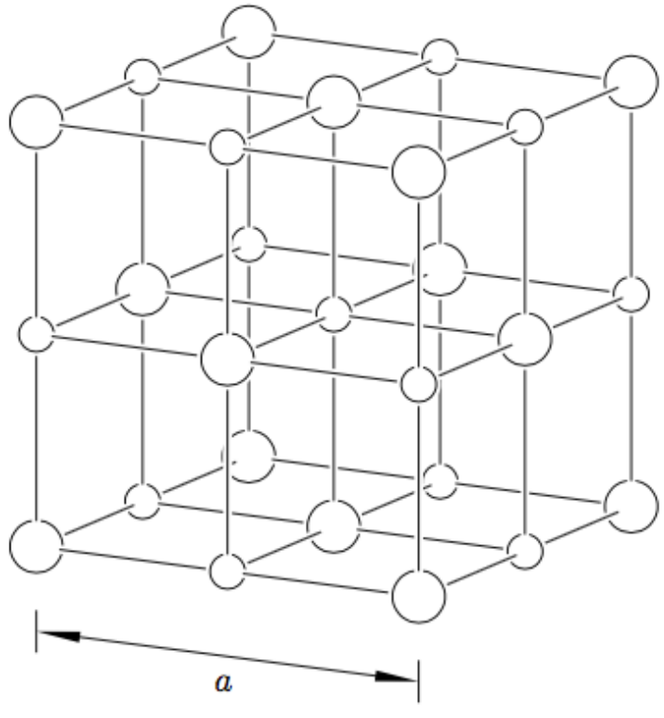

a


a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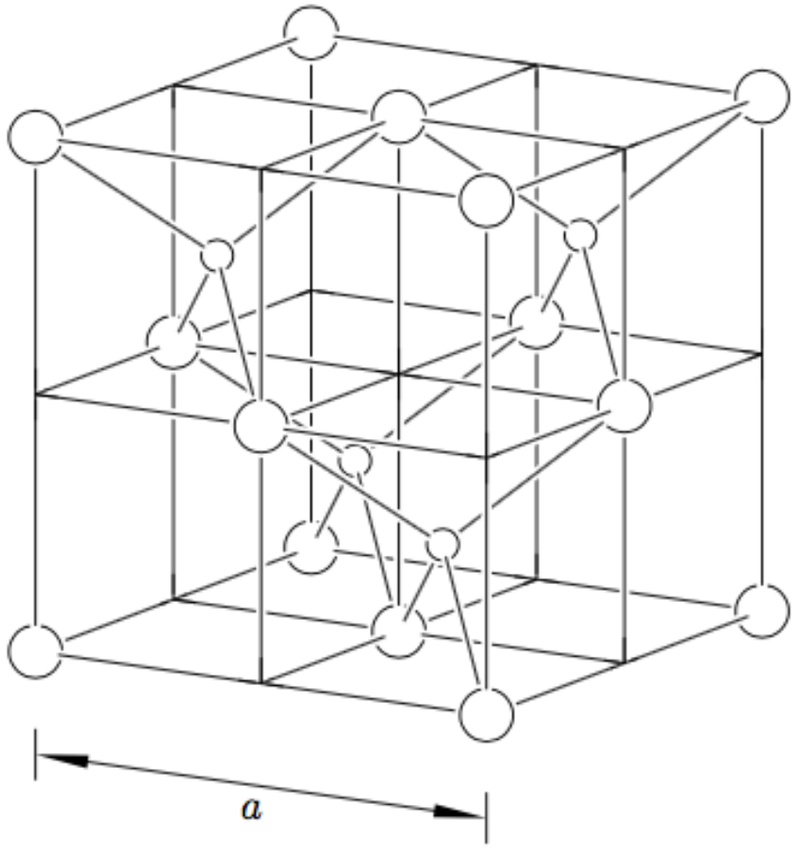
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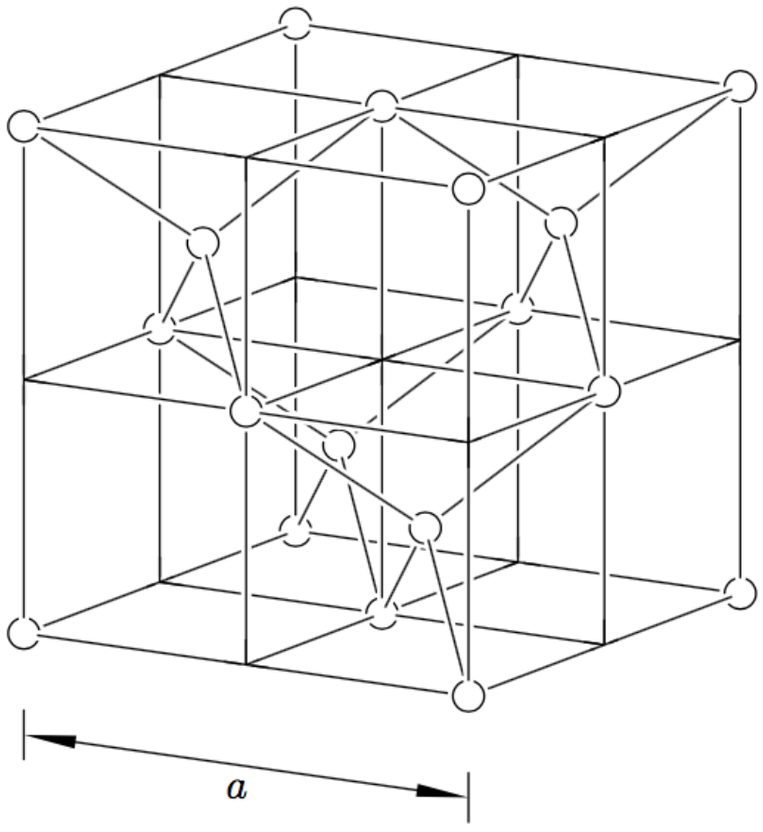
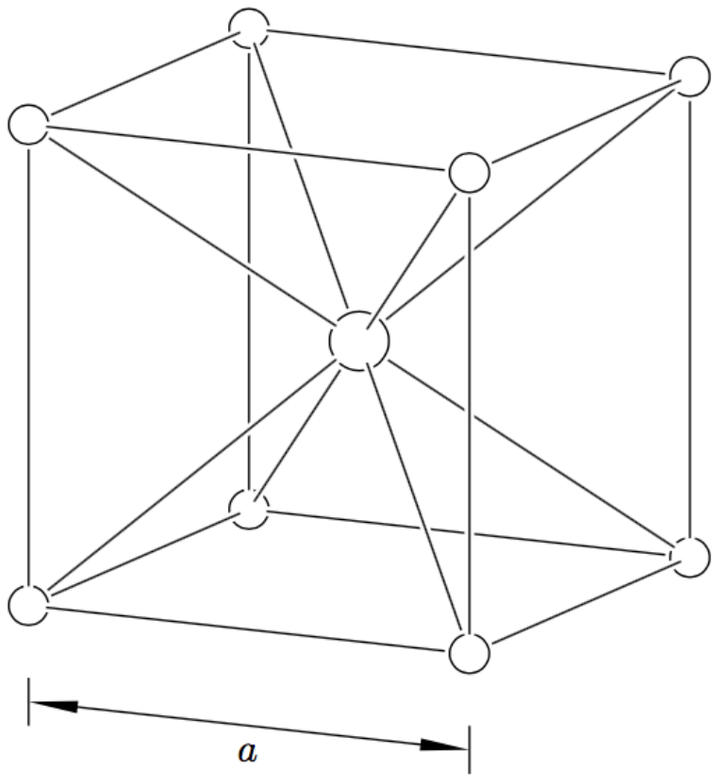
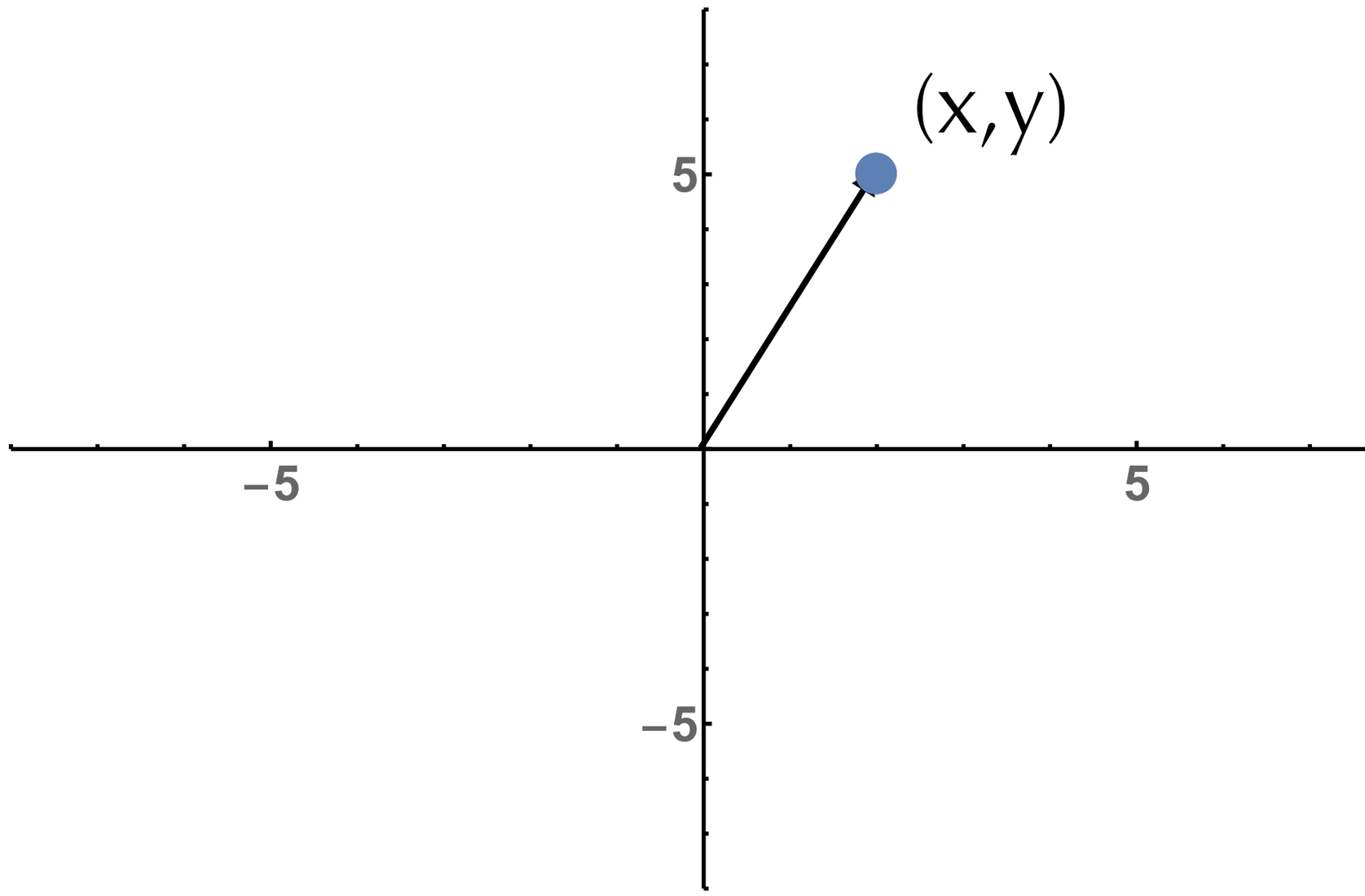

a


a

Question #17

How does the application of the operator modify the coordinates of the point shown?



a) $(x, y) \rightarrow (\bar{y}, x)$

b) $(x, y) \rightarrow (\bar{x}, \bar{y})$

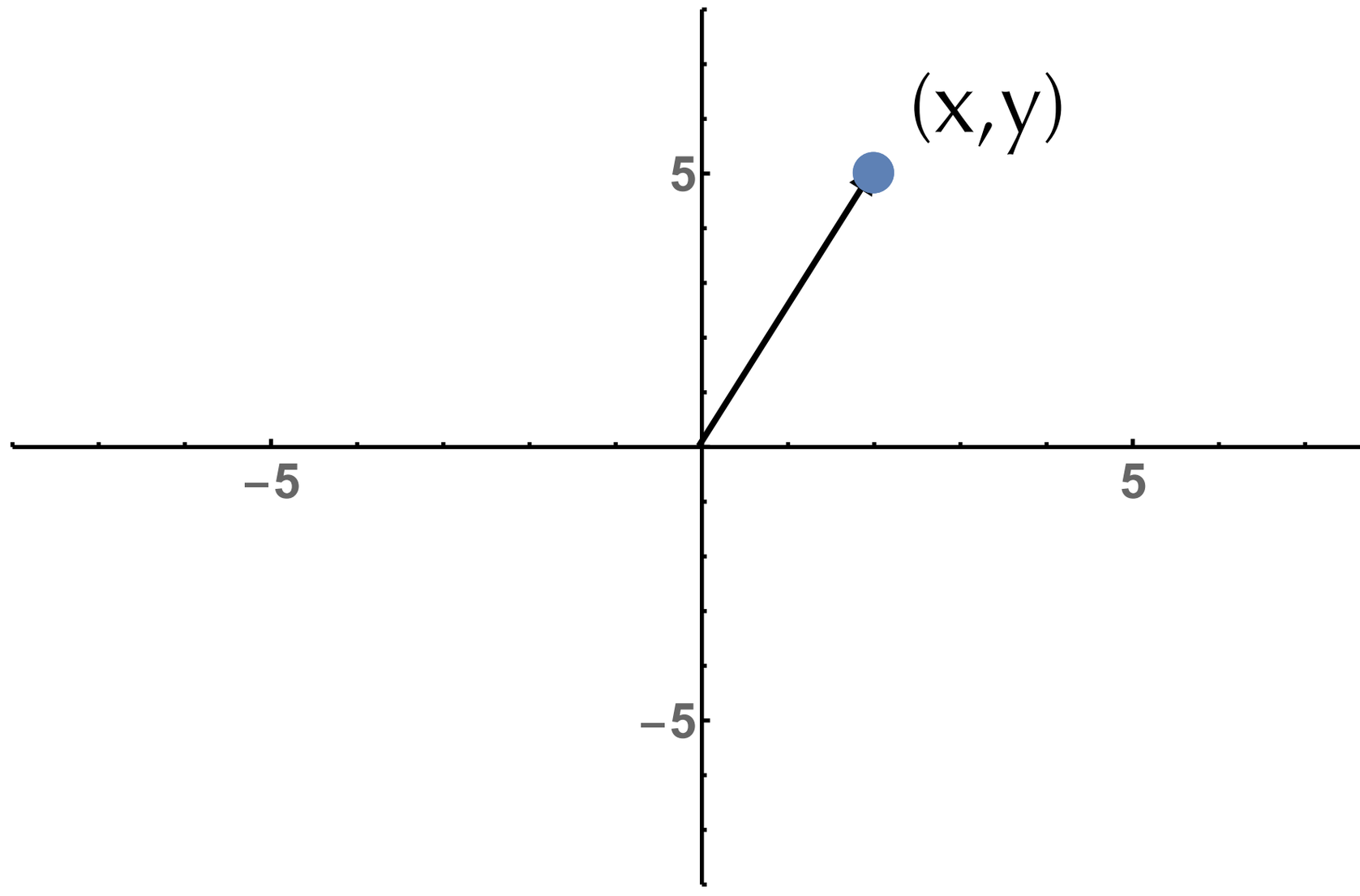
c) $(x, y) \rightarrow (y, x)$

d) $(x, y) \rightarrow (\bar{x}, y)$

e) $(x, y) \rightarrow (\bar{y}, \bar{x})$

Question #17

How does the application of the operator C_{2z}^{+} modify the coordinates of the point shown?



a) $(x, y) \rightarrow (\bar{y}, x)$

b) $(x, y) \rightarrow (\bar{x}, \bar{y})$

c) $(x, y) \rightarrow (y, x)$

d) $(x, y) \rightarrow (\bar{x}, y)$

e) $(x, y) \rightarrow (\bar{y}, \bar{x})$

Question #18

How does the application of the operator C_{4z}^{+} modify the coordinates of the point shown?

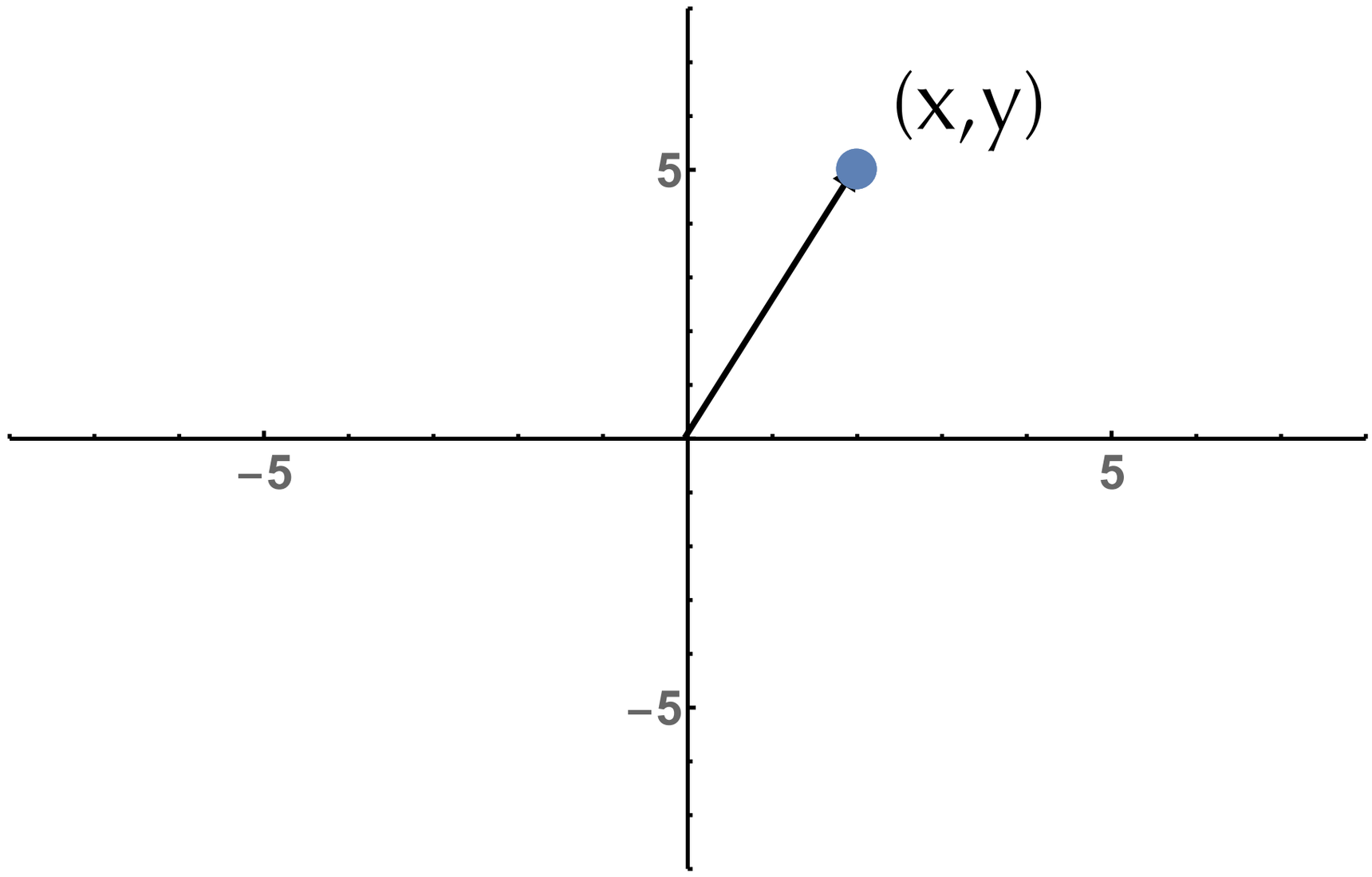
a) $(x, y) \rightarrow (\bar{x}, \bar{y})$

b) $(x, y) \rightarrow (\bar{x}, y)$

c) $(x, y) \rightarrow (y, x)$

d) $(x, y) \rightarrow (\bar{y}, x)$

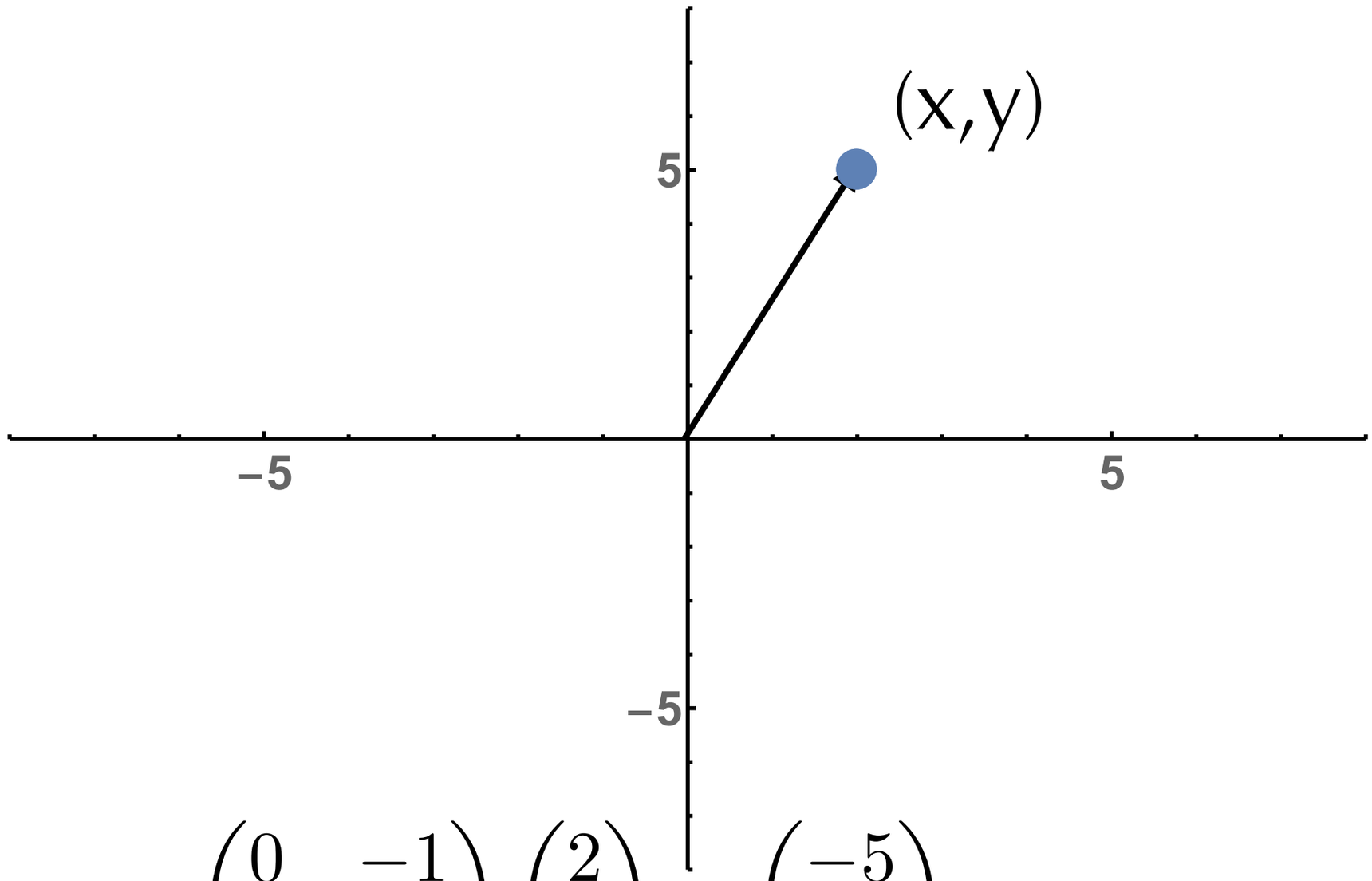
e) $(x, y) \rightarrow (\bar{y}, \bar{x})$



Question #18

How does the application of the operator C_{4z}^{+} modify the coordinates of the point shown?

a) $(x, y) \rightarrow (\bar{x}, \bar{y})$
b) $(x, y) \rightarrow (\bar{x}, y)$
c) $(x, y) \rightarrow (y, x)$
d) $(x, y) \rightarrow (\bar{y}, x)$
e) $(x, y) \rightarrow (\bar{y}, \bar{x})$



$$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \begin{pmatrix} 2 \\ 5 \end{pmatrix} = \begin{pmatrix} -5 \\ 2 \end{pmatrix}$$

Question #19

Which are *not* symmetry operators of this lattice?

C_{4z}^{+} C_{2z}^{+}

σ_x C_{4z}^{-}

σ_{da} σ_y

σ_{db} E

a) C_{4z}^{+}

b) C_{4z}^{-}

c) σ_y

d) S_{4z}^{+}

e) All are

Cayley table

	C_{4z}^{+}	C_{2z}^{+}						
C_{4z}^{+}								
C_{2z}^{+}								

Cayley table

	C_{4z}^+	C_{2z}^+						
C_{4z}^+	C_{2z}^+							
C_{2z}^+								

Cayley table

	C_{4z}^+	C_{2z}^+						
C_{4z}^+	C_{2z}^+	?						
C_{2z}^+								

Cayley table

	C_{4z}^{+}	C_{2z}^{+}						
C_{4z}^{+}	C_{2z}^{+}	?						
C_{2z}^{+}	?							

Cayley table

	C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}					
C_{4z}^{+}	C_{2z}^{+}	?						
C_{2z}^{+}	?							
C_{4z}^{-}								

Cayley table

	C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}					
C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}						
C_{2z}^{+}	C_{4z}^{-}							
C_{4z}^{-}								

Cayley table

	C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}					
C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}						
C_{2z}^{+}	C_{4z}^{-}	?						
C_{4z}^{-}								

Cayley table

	C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}					
C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}						
C_{2z}^{+}	C_{4z}^{-}	E						
C_{4z}^{-}								

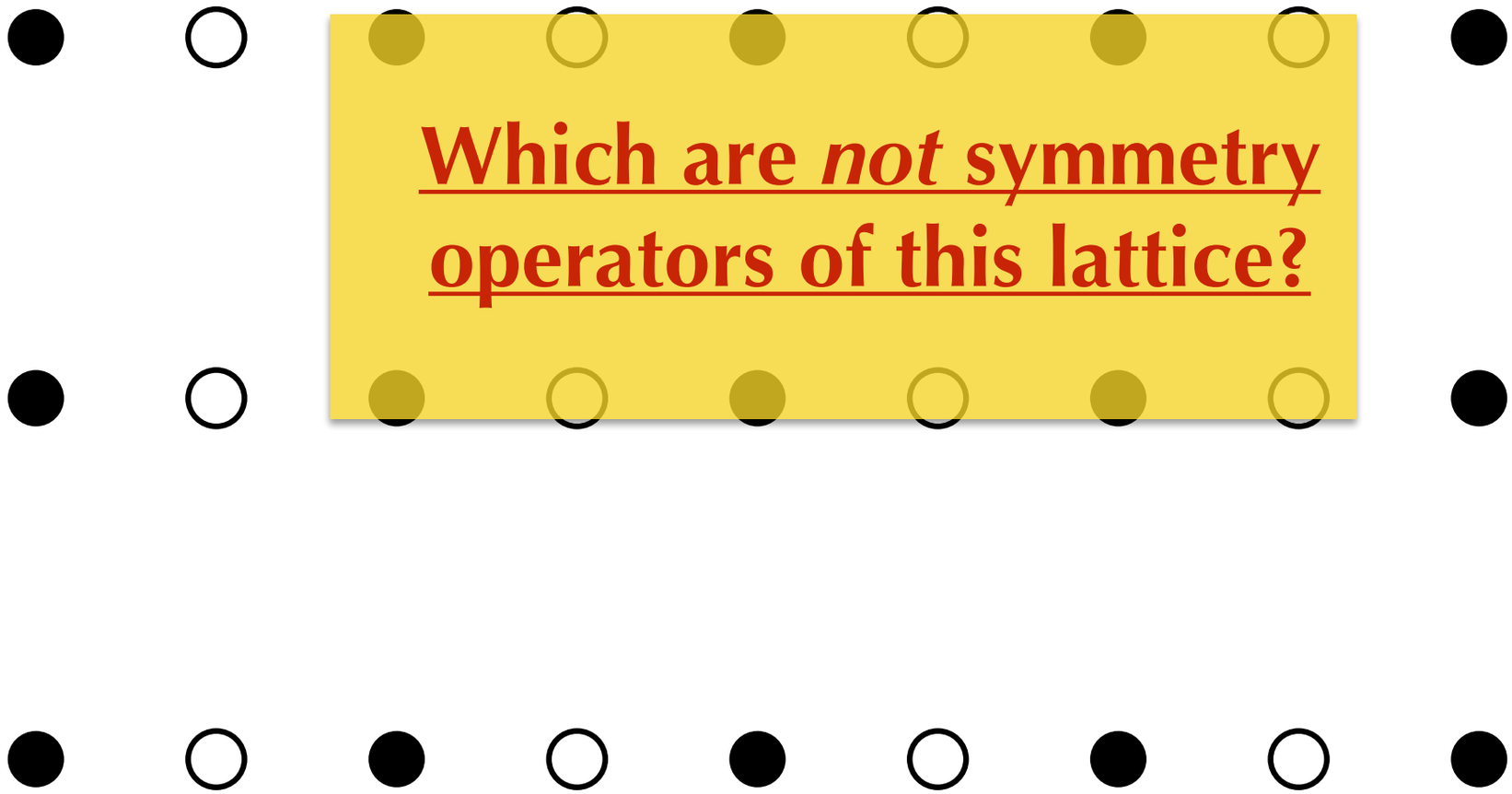
Cayley table

	C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}	E				
C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}	E					
C_{2z}^{+}	C_{4z}^{-}	E						
C_{4z}^{-}	E							
E								

Cayley table

	C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}	E	σ_x	σ_y	σ_{da}	σ_{db}
C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}	E	C_{4z}^{+}				
C_{2z}^{+}	C_{4z}^{-}	E	C_{4z}^{+}	C_{2z}^{+}				
C_{4z}^{-}	E	C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}				
E	C_{4z}^{+}	C_{2z}^{+}	C_{4z}^{-}	E				
σ_x	σ_{da}							
σ_y								
σ_{da}								

Question #20



Which are *not* symmetry operators of this lattice?

C_{4z}^{+} C_{2z}^{+}

σ_x C_{4z}^{-}

σ_{da} σ_y

σ_{db} E

a) C_{4z}^{+}

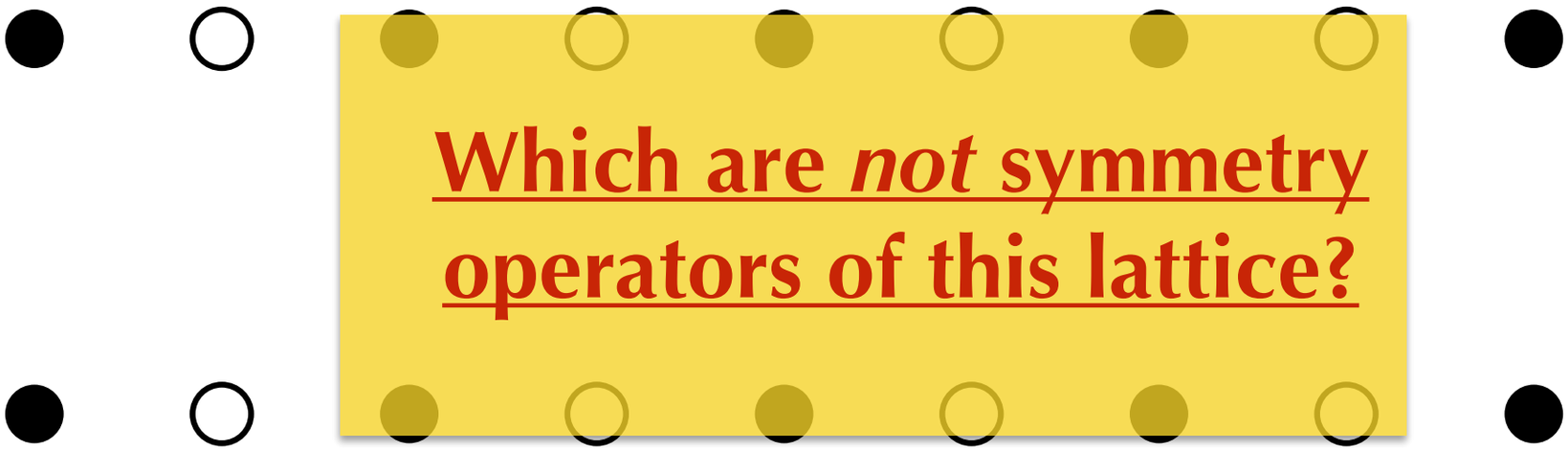
b) C_{4z}^{-}

c) All listed aren't

d) σ_{da}

e) σ_{db}

Question #20



Which are *not* symmetry operators of this lattice?

~~C_{4z}^{+}~~ C_{2z}^{+}

σ_x ~~C_{4z}^{-}~~

~~σ_{da}~~ σ_y

~~σ_{db}~~ E

a) C_{4z}^{+}

b) C_{4z}^{-}

c) All listed aren't

d) σ_{da}

e) σ_{db}

Question #21

Which are *not* symmetry operators of this lattice?

C_{4z}^{+} C_{2z}^{+}

σ_x C_{4z}^{-}

σ_{da} σ_y

σ_{db} E

a) C_{4z}^{+}

b) All listed aren't

c) σ_{da}

d) σ_{db}

e) C_{4z}^{-}

Question #21

Which are *not* symmetry operators of this lattice?

C_{4z}^{+} C_{2z}^{+}

σ_x C_{4z}^{-}

σ_a σ_y

σ_b E

a) C_{4z}^{+}

b) All listed aren't

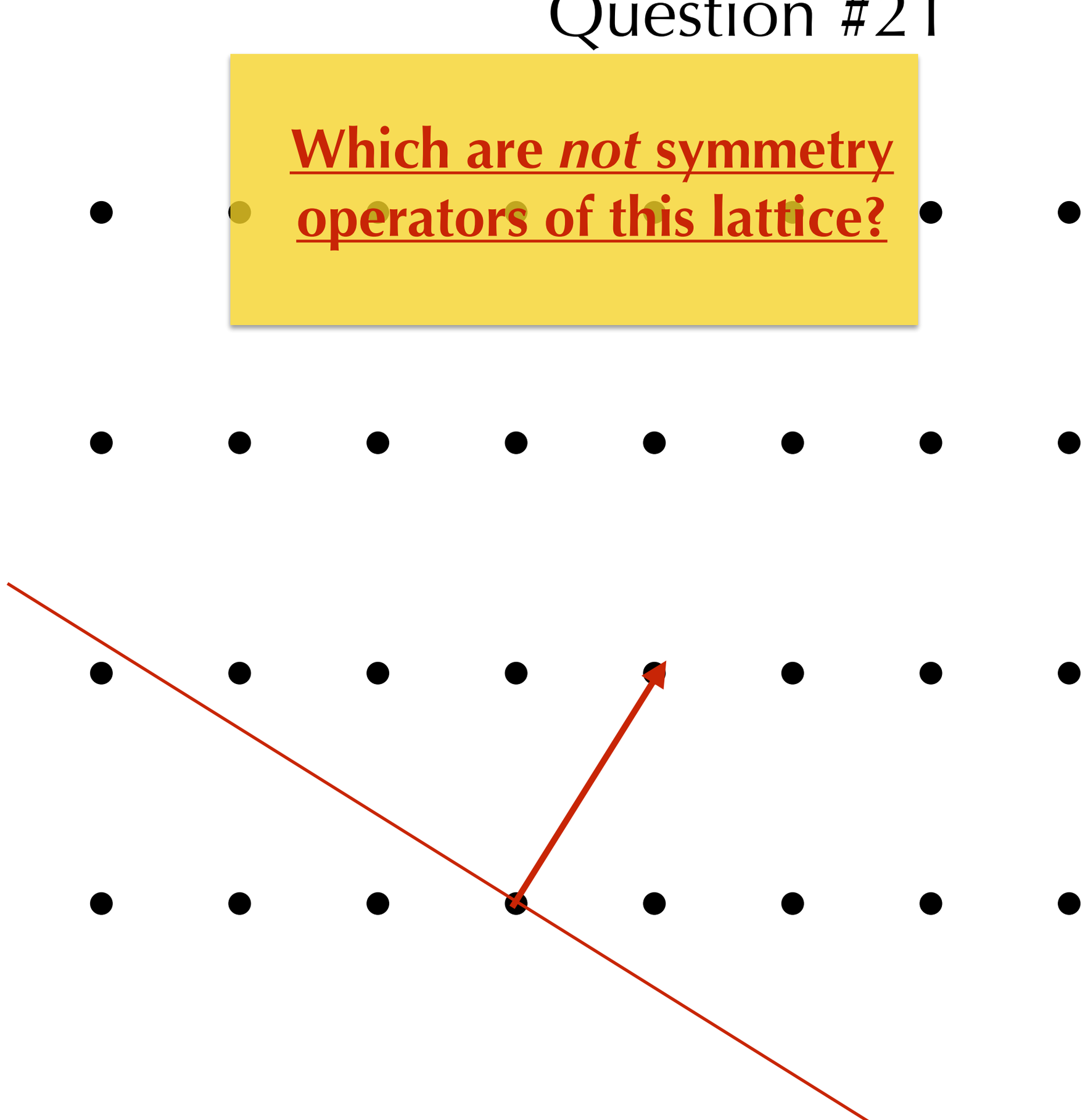
c) σ_{da}

d) σ_{db}

e) C_{4z}^{-}

Question #21

Which are *not* symmetry operators of this lattice?



a) C_{4z}^{+}

b) All listed aren't

c) σ_{da}

d) σ_{db}

e) C_{4z}^{-}

~~C_{4z}^{+}~~ C_{2z}^{+}

σ_x ~~C_{4z}^{-}~~

~~σ_a~~ σ_y

~~σ_b~~ E

Question #22

Which are *not* symmetry operators of this lattice?

C_{4z}^{+} C_{2z}^{+}

σ_x C_{4z}^{-}

σ_{da} σ_y

σ_{db} E

a) C_{4z}^{+}

b) C_{4z}^{-}

c) σ_{db}

d) All listed aren't

e) σ_{da}

Question #22

Which are *not* symmetry operators of this lattice?

~~C_{4z}^{+}~~ C_{2z}^{+}

σ_x ~~C_{4z}^{-}~~

~~σ_{da}~~ σ_y

~~σ_{db}~~ E

a) C_{4z}^{+}

b) C_{4z}^{-}

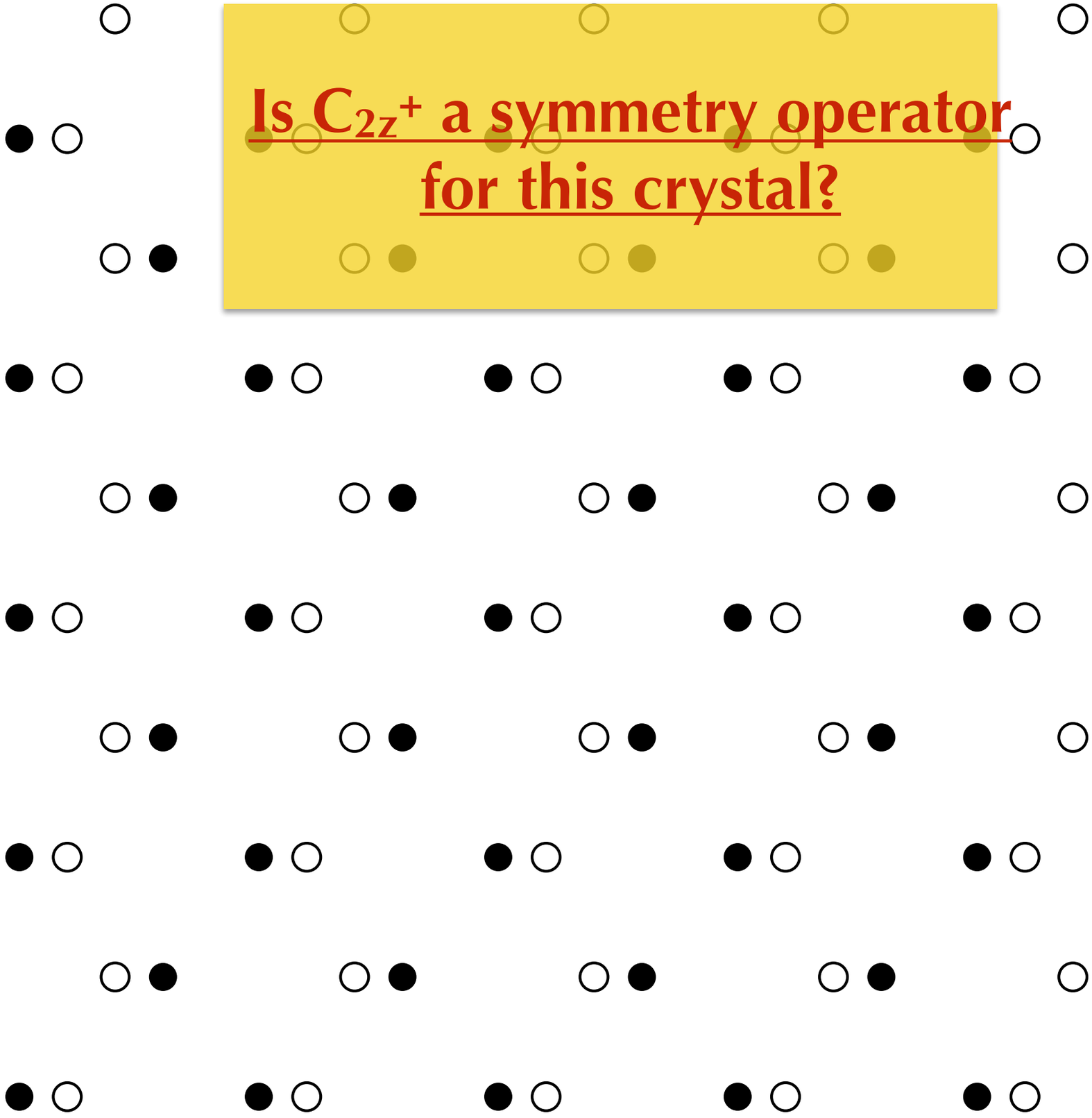
c) σ_{db}

d) All listed aren't

e) σ_{da}

Question #23

Is C_{2z}^{+} a symmetry operator for this crystal?



a).

B).

c). No

D) .

E) Yes

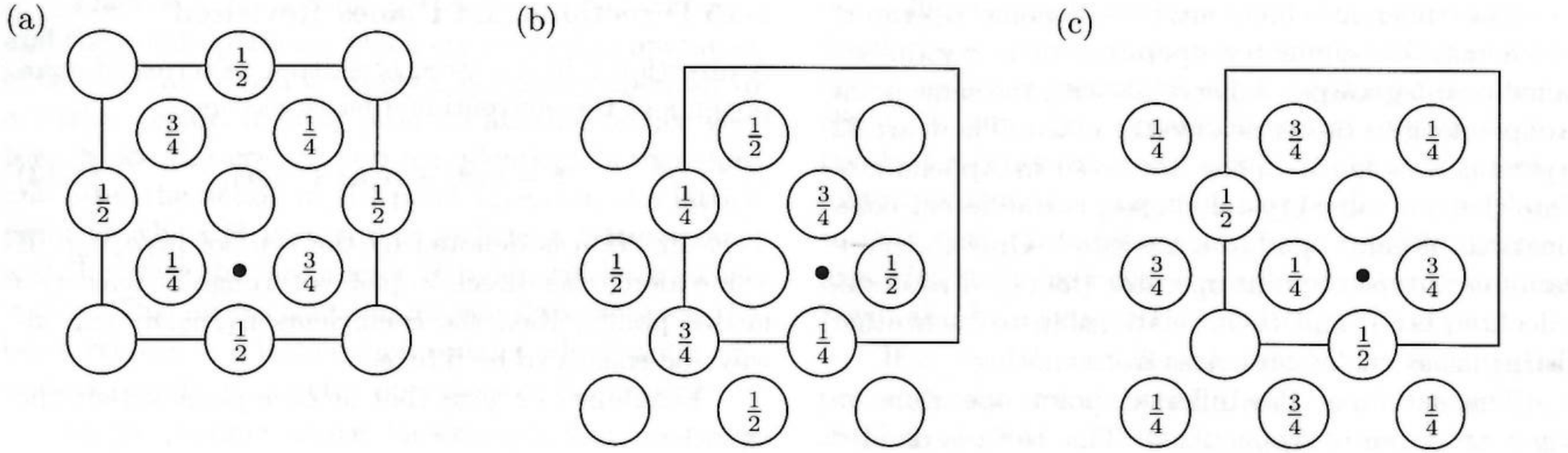
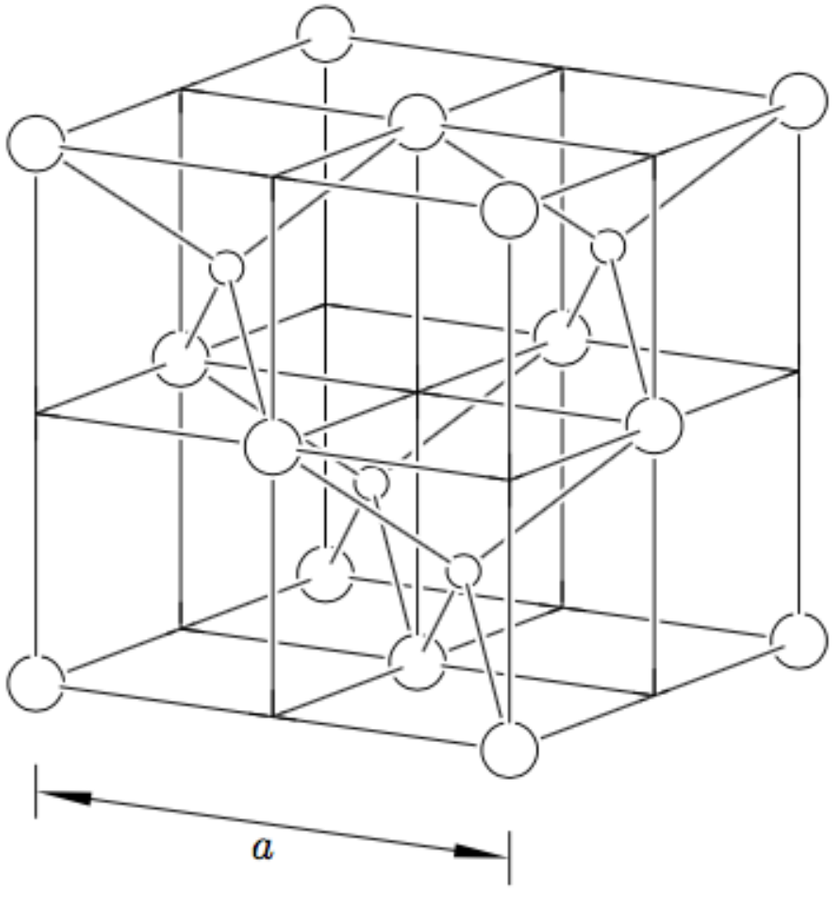


Fig. 1-32. (a) The projection of the diamond structure onto the xy plane. The fractions indicate the z coordinates of the atoms. Those with no fraction shown are in the xy plane ($z = 0$). (b) The crystal is rotated by 90° about an axis in the z direction through the solid dot shown. (c) The crystal is translated in the z direction by $\frac{1}{4}$.



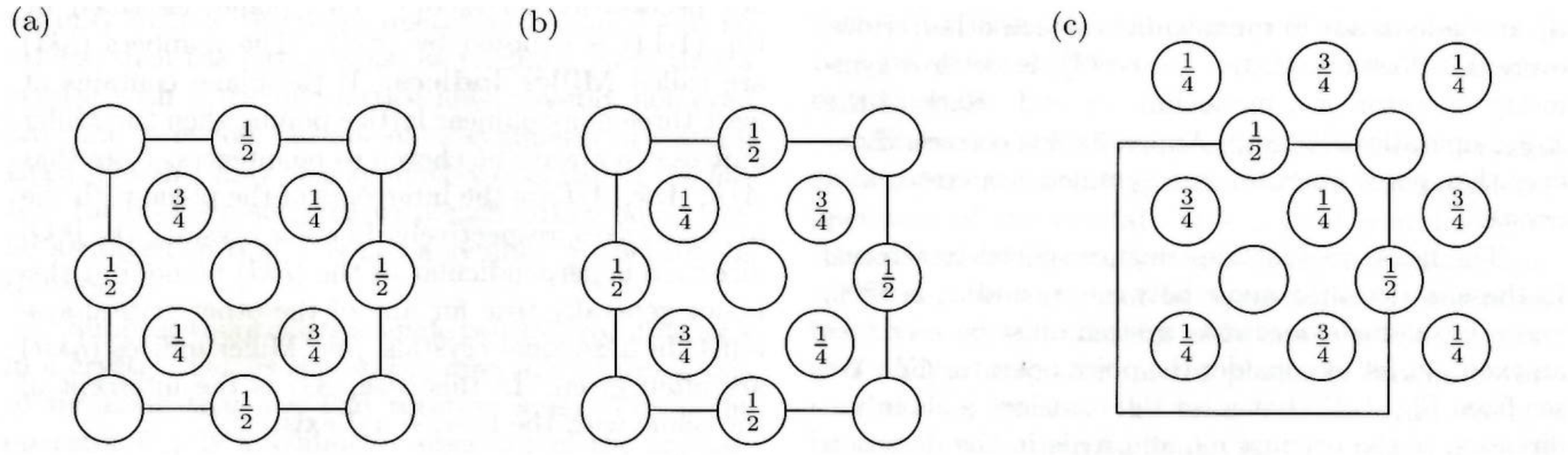
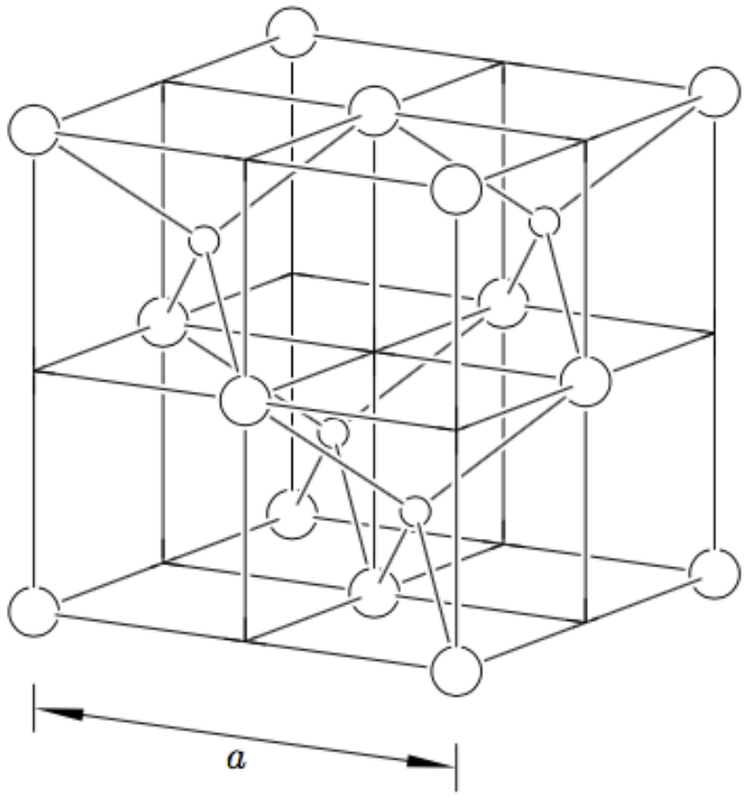


Fig. 1-33. (a) The projection of the diamond structure onto the xy plane, as in Fig. 1-32. (b) The crystal is reflected through the xy plane. (c) The crystal is translated by $(\frac{1}{4}, \frac{1}{4}, \frac{1}{4})$.



	Bravais Lattice (only consider the lattice)	Crystal Structure (consider the lattice + the atoms)
Number of Point groups. (Just point operators)	7 (The 7 crystal systems)	32 (The 32 crystallographic point groups)
Number of Space Groups. (now add translations)	14 (The 14 Bravais Lattices)	230 (The 230 space groups)