APPENDICES
APPENDIX I

\[ X = \{ a, b, c \}, \ J = \{ \phi, \{ a \}, X \}, \ A \subseteq X \]

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1. \( \text{RO}(3) = \{ \phi, X \} = \text{RC}(3) = \text{SR}(3) \)
2. \( \mathcal{J}^0 = \{ \phi, \{ a \}, \{ a; b \}, \{ a, c \}, X \} = \text{SO}(3) = \text{PO}(3) = \text{SPO}(3) \)
3. \( 2^X = p(3) = q(3) \)
4. \( \text{SC}(3) = \{ \phi, \{ b \}, \{ c \}, \{ b, c \}, X \} = \text{PC}(3) = \text{SPC}(3) \)
APPENDIX II

\[ X = \{a, b, c\}, \mathcal{I} = \{\phi, X, \{a\}, \{a,b\}\}, \ A \subseteq X \]

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1. \( RO(3) = \{\phi, X\} = RC(3) = SR(3) \)
2. \( J^a = \{\phi, \{a\}, \{a, b\}, \{a, c\}, X\} \)
   \hspace{1cm} = SO(3)
   \hspace{1cm} = PO(3)
   \hspace{1cm} = SPO(3)
3. \( p(3) = 2^X \)
   \hspace{1cm} = q(3)
4. \( SC(3) = \{\phi, \{b\}, \{c\}, \{b, c\}, X\} = PC(3) = SPC(3) \)
APPENDIX III

\[ X = \{a, b, c\}, \mathcal{I} = \{\emptyset, X, \{a\}, \{b, c\}\}, A \subseteq X \]

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1. \(\text{RO}(\mathcal{I}) = \mathcal{I}\)
   \[= \mathcal{I}^\emptyset\]
   \[= \text{SO}(\mathcal{I}) = \text{SC}(\mathcal{I}) = \text{SR}(\mathcal{I})\]
   \[= \text{q}(\mathcal{I}) = \text{RC}(\mathcal{I})\]

2. \(\text{PO}(\mathcal{I}) = 2^X\)
   \[= \text{SPO}(\mathcal{I}) = \text{PC}(\mathcal{I}) = \text{SPC}(\mathcal{I})\]
   \[= \text{p}(\mathcal{I})\]
**APPENDIX IV**

\[ X = \{a, b, c\}, \mathcal{I} = \{\phi, X, \{a\}, \{a, b\}, \{a, c\}\}, A \subseteq X \]

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1. RO(3) = \(\{\phi, X\}\) = RC(3) = SR(3)
2. \(3^e\) = \(3\)
   = SO(3)
   = PO(3)
   = SPO(3)
3. p(3) = \(2^X\)
   = q(3)
4. SC(3) = \(\{\phi, \{b\}, \{c\}, \{b, c\}, X\}\) = PC(3) = SPC(3)
APPENDIX V

\(X = \{a, b, c\}, \mathcal{S} = \{\emptyset, X, \{a\}, \{b\}, \{a, b\}\}, A \subseteq X\)

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1. \(RO(3) = \{\emptyset, \{a\}, \{b\}, X\}\)
2. \(S^a = 3\)  
   = \(PO(3)\)
3. \(SO(3) = \{\emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}, \{b, c\}, X\}\)  
   = \(SPO(3)\)
4. \(p(3) = \{\emptyset, \{c\}, \{a, b\}, X\}\)
5. \(q(3) = 2^X\)
6. \(SC(3) = \{\emptyset, \{a\}, \{b\}, \{c\}, \{a, c\}, \{b, c\}, X\}\)  
   = \(SPC(3)\)
7. \(SR(3) = \{\emptyset, \{a\}, \{b\}, \{a, c\}, \{b, c\}, X\}\)
8. \(RC(3) = \{\emptyset, \{a, c\}, \{b, c\}, X\}\)
9. \(PC(3) = \{\emptyset, \{c\}, \{a, c\}, \{b, c\}, X\}\)
APPENDIX VI

\[ X = \{a, b, c\}, \mathcal{I} = \{\emptyset, X, \{a\}, \{b\}, \{a, b\}, \{a, c\}\}, A \subseteq X \]

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1. \(RO(3) = \{\emptyset, \{b\}, \{a, c\}, X\} = RC(3) = SR(3)\)
2. \(3^\circ = 3\)
   \(= SO(3)\)
   \(= PO(3)\)
   \(= SPO(3)\)
3. \(p(3) = 2^X\)
   \(= q(3)\)
4. \(SC(3) = \{\emptyset, \{c\}, \{b\}, \{a, c\}, \{b, c\}, X\} = PC(3) = SPC(3)\)
APPENDIX VII

Let $X$ be an infinite set with finite complement topology. Let $A \subseteq X$.

$$\mathcal{I} = \{\emptyset\} \cup \{A \subseteq X : X \setminus A \text{ is finite}\}$$

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1. $RO(\mathcal{I}) = \{\emptyset, X\} = RC(\mathcal{I}) = SR(\mathcal{I})$
2. $\mathcal{I}^a = \mathcal{I}$
   $= SO(\mathcal{I})$
3. $PO(\mathcal{I}) = \mathcal{I} \cup \{A \subseteq X : A \text{ and } X \setminus A \text{ are both infinite}\}$
   $= SPO(\mathcal{I})$
4. $p(\mathcal{I}) = 2^X$
5. $q(\mathcal{I}) = \mathcal{I} \cup \{A \subseteq X : A \text{ is finite}\}$
6. $SC(\mathcal{I}) = \{X\} \cup \{A \subseteq X : A \text{ is finite}\}$
7. $PC(\mathcal{I}) = \{X\} \cup \{A \subseteq X : X \setminus A \text{ is infinite}\} = SPC(\mathcal{I})$
Let $X$ contain at least three elements. Let $a \in X$. Consider the $a$-inclusion topology $\mathcal{I} = \{\emptyset\} \cup \{B \subseteq X : a \in B\}$. Let $A \subseteq X$.

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1. $RO(\mathcal{I}) = \{\emptyset, X\} = RC(\mathcal{I}) = SR(\mathcal{I})$

2. $\mathcal{I}^a = \mathcal{I}$
   = $SO(\mathcal{I})$
   = $PO(\mathcal{I})$
   = $SPO(\mathcal{I})$

3. $p(\mathcal{I}) = 2^X$
   = $q(\mathcal{I})$

4. $SC(\mathcal{I}) = \{X\} \cup \{B \subseteq X : a \notin B\}$
   = $PC(\mathcal{I})$
   = $SPC(\mathcal{I})$
Let $X$ be a set with at least one element $a$. Let $X$ be assigned with a-exclusion topology $\mathcal{J} = \{ X \} \cup \{ B \subseteq X : a \notin B \}$. Let $A \subseteq X$.

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<td>$A$</td>
</tr>
<tr>
<td>when $a \in A$ and $A \neq X$</td>
<td>$X$</td>
<td>$X$</td>
<td>$X$</td>
<td>$X$</td>
<td>$X$</td>
<td>$X$</td>
</tr>
</tbody>
</table>

1. $RO(\mathcal{J}) = 3 \setminus \{X \setminus \{a\}\}$
2. $\mathcal{J}^{\alpha} = PO(\mathcal{J})$
3. $SO(\mathcal{J}) = 2^X = SPO(\mathcal{J}) = q(\mathcal{J}) = SC(\mathcal{J}) = SPC(\mathcal{J}) = SR(\mathcal{J})$
4. $p(\mathcal{J}) = \{\phi, X\}$
5. $RC(\mathcal{J}) = \{\phi\} \cup \{B \subseteq X : a \in B \text{ and } B \neq \{a\}\}$
6. $PC(\mathcal{J}) = \{\phi\} \cup \{B \subseteq X : a \in B\}$
Let $X = \{0, 1, 2, 3, \ldots\}$ and $\mathcal{I} = \{\emptyset, \{0\}, X\}$. Let $A \subseteq X$.

<table>
<thead>
<tr>
<th>$A$</th>
<th>$A^0$</th>
<th>$A^\circ$</th>
<th>$A^\circ_\circ$</th>
<th>$A^\circ_\circ_\circ$</th>
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</thead>
<tbody>
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<td>$\emptyset$</td>
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</tr>
<tr>
<td>when $0 \notin A$</td>
<td>$\emptyset$</td>
<td>$X \setminus {0}$</td>
<td>$\emptyset$</td>
<td>$\emptyset$</td>
<td>$\emptyset$</td>
<td>$\emptyset$</td>
</tr>
<tr>
<td>when $0 \in A$ and $A \neq X$</td>
<td>${0}$</td>
<td>$X$</td>
<td>$X$</td>
<td>$X$</td>
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</tr>
</tbody>
</table>

1. $RO(3) = (\emptyset, X) = RC(3) = SR(3)$
2. $\mathcal{I}^\circ = \text{inclusion topology on } X$
   \[ = SO(3) \]
   \[ = PO(3) \]
   \[ = SPO(3) \]
3. $p(3) = 2^X$
   \[ = q(3) \]
4. $SC(3) = \text{exclusion topology on } X$
   \[ = PC(3) \]
   \[ = SPC(3) \]
Let $X = \{a, b\}$, $\mathcal{J} = \{\phi, \{a\}, X\}$. Let $A \subseteq X$.

| A       | $A^0$ | $A^-| | A^{0-} | A^{-0} | A^{0-0} | A^{-0-} |
|---------|-------|------|--------|--------|---------|---------|
| $\phi$  | $\phi$| $\phi$| $\phi$ | $\phi$ | $\phi$  | $\phi$  |
| $\{a\}$ | $\{a\}$| $X$   | $X$    | $X$    | $X$    | $X$    |
| $\{b\}$ | $\phi$ | $\{b\}$| $\phi$ | $\phi$ | $\phi$ | $\phi$ |
| $X$     | $X$   | $X$   | $X$    | $X$    | $X$    | $X$    |

1. $R(3) = \{\phi, X\} = RC(3) = SR(3)$
2. $3^\alpha = 3$
   = $SO(3)$
   = $PO(3)$
   = $SPO(3)$
3. $p(3) = 2^X$
   = $q(3)$
4. $SC(3) = \{\phi, \{b\}, X\}$
   = $PC(3)$
   = $SPC(3)$