

Exercícios – Aula 7  
(Soluções)

a.  $p \wedge q \vdash q \wedge p$

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|----|--------------|----------------|
| 1. | $p \wedge q$ | P              |
| 2. | $p$          | 1 $\wedge$ e   |
| 3. | $q$          | 1 $\wedge$ e   |
| 4. | $q \wedge p$ | 2,3 $\wedge$ i |

b.  $(p \wedge q) \rightarrow (r \wedge s), \sim\sim p, q \vdash s$

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|----|---|----------------|
| 1. | $(p \wedge q) \rightarrow (r \wedge s)$ | P              |
| 2. | $\sim\sim p$                            | P              |
| 3. | $q$                                     | P              |
| 4. | $p$                                     | 2 $\sim$ e     |
| 5. | $p \wedge q$                            | 3,4 $\wedge$ i |
| 6. | $r \wedge s$                            | 1,5 MP         |
| 7. | $s$                                     | 6 $\wedge$ e   |

c.  $p \vdash p \wedge p$

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|----|--------------|----------------|
| 1. | $p$          | P              |
| 2. | $p \wedge p$ | 1,1 $\wedge$ i |