**#5.**

1. P → r
2. P ∧ q → r
3. (p ∨ q) ↔ r

**#9.**

|  |  |  |  |
| --- | --- | --- | --- |
| p | q | r | (p → q) ∧ (p → r) |
| T | T | T | T |
| T | T | F | F |
| T | F | T | F |
| T | F | F | F |
| F | T | T | T |
| F | T | F | T |
| F | F | T | T |
| F | F | F | T |

**#10.**

[p ∧ (p → q)] → q is a tautology.