6.7

Olivier Berg

I)

$$\dfrac{\dfrac{[P]}{R \vee P}\,\vee\text{Intro } 2}{P \to (R \vee P)}\,\to\text{Intro}$$

✓

II)

$$\dfrac{\dfrac{R \wedge Q}{Q}\,\wedge\text{Elim } 2 \qquad \dfrac{R \wedge Q}{R}\,\wedge\text{Elim } 1}{Q \wedge R}\,\wedge\text{Intro}$$

✓

III)

$$\dfrac{\dfrac{\dfrac{P \to Q \qquad [P]}{Q}\,\to\text{Elim} \qquad [\neg Q]}{\neg P}\,\neg\text{Intro}}{\neg Q \to \neg P}\,\to\text{Intro}$$

✓

IV)

$$\dfrac{\dfrac{\dfrac{[P \to \neg P] \qquad [P]}{\neg P}\,\to\text{Elim} \qquad [P]}{\neg P}\,\neg\text{Intro}}{(P \to \neg P) \to \neg P}\,\to\text{Intro}$$

✓

V)

$$\dfrac{\dfrac{\dfrac{P \leftrightarrow Q \qquad [P]}{Q}\,\leftrightarrow\text{Elim } 1 \qquad \neg Q}{\neg P}\,\neg\text{Intro}}$$

✓

VI)

$$\dfrac{\dfrac{[P] \quad [Q]}{P \wedge Q}\,\wedge\text{Intro} \qquad (P \wedge Q) \to R}{\dfrac{R}{Q \to R}\,\to\text{Intro}}\,\to\text{Elim}\;\to\text{Intro}$$

$$P \to (Q \to R)$$

✓

VII)

$$\dfrac{\dfrac{\dfrac{[\neg P]}{\neg Q \to \neg P}\,\to\text{Intro} \qquad [\neg Q]}{\neg P}\,\to\text{Elim} \qquad [P]}{Q}\,\neg\text{Elim}\;\to\text{Intro}$$

$$\dfrac{P \to Q \qquad \neg(P \to Q)}{P}\,\neg\text{Elim}$$

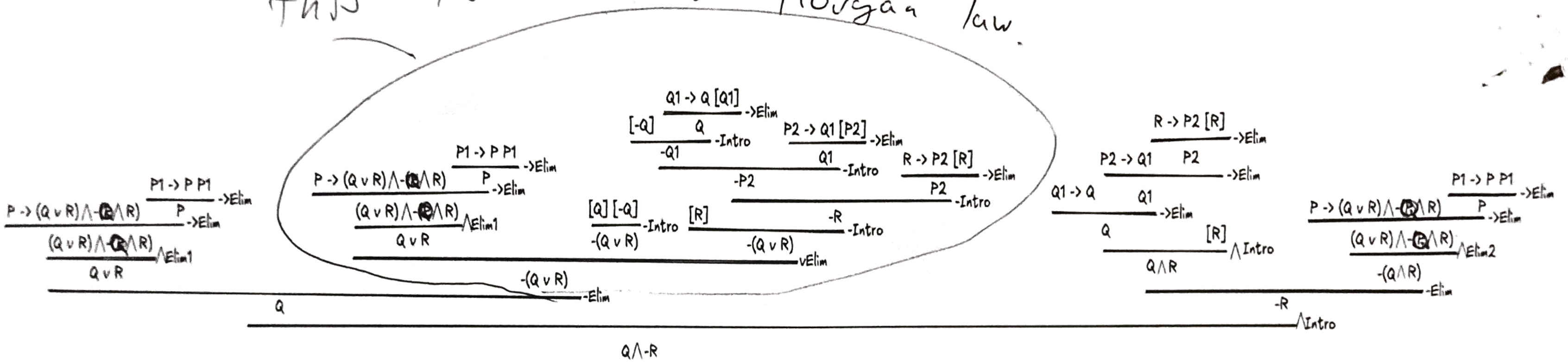
A faster way would be:

$$\dfrac{\dfrac{[\neg P] \quad [P]}{Q}\,\neg\text{Elim}\;\to\text{Intro}}{P}\,\neg\text{Elim}$$

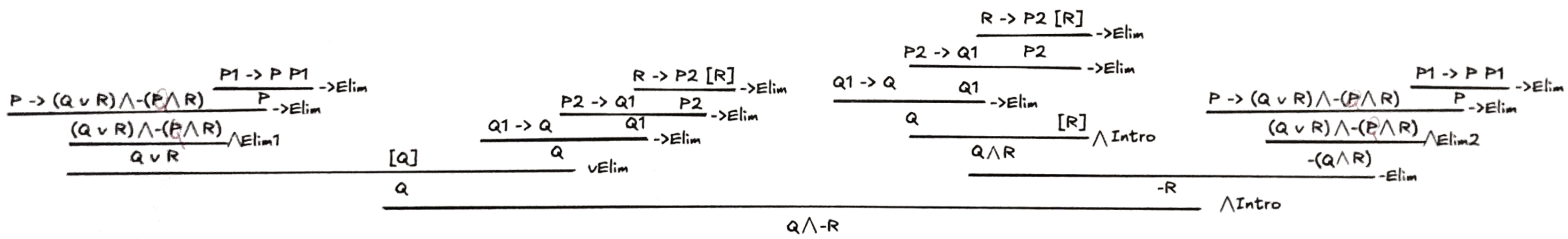
✓

this is how Hulbert does it

this is the De-Morgan law.



this is the easier way to show it.



Lovely! Feel free to stick to the easier way.