RESOLUÇÃO DE PROBLEMAS COM LÓGICA MATEMÁTICA

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Exercício 1

a) $VL(p_a) = F$
b) $VL(p_b) = F$
c) $VL(p_c) = V$

Exercício 2

a) $VL(p_a) = V$
b) $VL(p_b) = F$
c) $VL(p_c) = V$
d) $VL(p_d) = V$

Exercício 3

a) $(\sim a) \wedge b = F$

$$(\sim a) \wedge b$$
$$(\sim V) \wedge F$$
$$F \wedge F$$
$$\therefore F$$

b) $(\sim b) \rightarrow (a \vee b) = V$

$$(\sim b) \rightarrow (a \vee b)$$
$$(\sim F) \rightarrow (V \vee F)$$
$$V \rightarrow V$$
$$\therefore V$$

c) $(c \vee a) \leftrightarrow \big(\sim(\sim c)\big) = F$

$$(c \vee a) \leftrightarrow \big(\sim(\sim c)\big)$$
$$(F \vee V) \leftrightarrow \big(\sim(\sim F)\big)$$
$$V \leftrightarrow F$$
$$\therefore F$$

d) $a \vee (a \rightarrow b) = V$

$$a \vee (a \rightarrow b)$$
$$V \vee (V \rightarrow F)$$
$$V \vee F$$
$$\therefore V$$

e) $\big(d \vee (\sim a)\big) \rightarrow (\sim c) = V$

$$\big(d \vee (\sim a)\big) \rightarrow (\sim c)$$
$$\big(V \vee (\sim V)\big) \rightarrow (\sim F)$$
$$(V \vee F) \rightarrow V$$
$$V \rightarrow V$$
$$\therefore V$$

f) $\big(\sim(a \wedge b)\big) \rightarrow \big(\sim(c \wedge b)\big) = V$

$$\big(\sim(a \wedge b)\big) \rightarrow \big(\sim(c \wedge b)\big)$$
$$\big(\sim(V \wedge F)\big) \rightarrow \big(\sim(F \wedge V)\big)$$
$$(\sim F) \rightarrow (\sim F)$$
$$V \rightarrow V$$
$$\therefore V$$

Exercício 4

a) $\sim(p \rightarrow \sim q)$

p	q	$\sim$	$(p$	$\rightarrow$	$\sim$	$q)$
V	V	V	V	F	F	V
V	F	F	V	V	V	F
F	V	F	F	V	F	V
F	F	F	F	V	V	F

b) $p \leftrightarrow \sim q \wedge r$

p	q	r	p	$\leftrightarrow$	$\sim$	q	$\wedge$	r
V	V	V	V	F	F	V	F	V
V	V	F	V	F	F	V	F	F
V	F	V	V	V	V	F	V	V
V	F	F	V	F	V	F	F	F
F	V	V	F	V	F	V	F	V
F	V	F	F	V	F	V	F	F
F	F	V	F	F	V	F	V	V
F	F	F	F	V	V	F	F	F

c) $p \rightarrow \sim q \wedge p \vee q \leftrightarrow p \vee \sim q$

p	q	p	$\rightarrow$	$\sim$	q	$\wedge$	p	$\vee$	q	$\leftrightarrow$	p	$\vee$	$\sim$	q
V	V	V	V	F	V	F	V	V	V	V	V	V	F	V
V	F	V	V	V	F	V	V	V	F	V	V	V	V	F
F	V	F	V	F	V	F	F	V	V	V	F	V	F	V
F	F	F	V	V	F	F	F	F	F	F	F	F	V	F