Exercício:
Determine $V_P, V_{\sim P}, V_Q, V_{\sim Q}, V_{P\wedge Q}, V_{P\vee Q}, V_{P\to Q}, V_{P\leftrightarrow Q}, V_{\sim P\to Q}, V_{P\wedge\sim Q}, V_{\sim P\leftrightarrow\sim Q}$ em cada um dos exercícios abaixo:

a) $P(x)$: "x^2-x é par" e $Q(x)$: "$2x < x^2$", ambas sentenças abertas definidas no domínio $D = \{-1,1,2,3,5,6\}$

b) $P(x)$: "x^2- 2 é primo" e $Q(x)$: "$x^3 < x^2 + x$", ambas sentenças abertas definidas no domínio $D = \{-1,1,2,3,5,6\}$

c) $P(x,y)$: "$xy < x^2$" e $Q(x,y)$: "$y < x + y$", ambas sentenças abertas definidas em $A \times B$, onde $A = \{-2,-1,0,2\}$ e $B = \{-1,3\}$

d) $P(\boldsymbol{y},\boldsymbol{x})$: "x<$x^2$y" e $Q(y,x)$: "$y \leq 2x$", ambas sentenças abertas definidas em $A \times B$, onde $A = \{-3,0,2\}$ e $B = \{-1,4,5\}$

e) $P(x)$: "3x^2- x é par" e $Q(x)$: "$x^3 - x^2 + x$ *não é primo*", com as sentenças abertas definidas nos domínios $D_P = \{-1,1,2,3,5,6\}$ e $D_Q = \{1,2,3,4\}$, respectivamente

Respostas:

a) $V_P = D, V_{\sim P} = \emptyset, V_Q = \{-1,3,5,6\}, V_{\sim Q} = \{1,2\}, V_{P\wedge Q} = \{-1,3,5,6\}$,
$V_{P\vee Q} = D, V_{P\to Q} = \{-1,3,5,6\}, V_{P\leftrightarrow Q} = \{-1,3,5,6\}, V_{\sim P\to Q} = D$,
$V_{P\wedge\sim Q} = \{1,2\}, V_{\sim P\leftrightarrow\sim Q} = V_{P\leftrightarrow Q} = \{-1,3,5,6\}$

b) $V_P = \{2,3,5\}, V_{\sim P} = \{-1,1,6\}, V_Q = \{-1,1\}, V_{\sim Q} = \{2,3,5,6\}, V_{P\wedge Q} = \emptyset$,
$V_{P\vee Q} = \{-1,1,2,3,5\}, V_{P\to Q} = \{-1,1,6\}, V_{P\leftrightarrow Q} = \{6\}, V_{\sim P\to Q} = V_{P\vee Q}$,
$V_{P\wedge\sim Q} = \{2,3,5\}, V_{\sim P\leftrightarrow\sim Q} = V_{P\leftrightarrow Q}$

c) $V_P = \{(-2,-1),(-2,3),(-1,3),(2,-1)\}$,
$V_{\sim P} = \{(-1,-1),(0,-1),(0,3),(2,3)\}, V_Q = \{(2,-1),(2,3)\}$,
$V_{\sim Q} = \{(-2,-1),(-2,3),(-1,-1),(-1,3),(0,-1),(0,3)\}$,
$V_{P\wedge Q} = \{(2,-1)\}, V_{P\vee Q} = \{(-2,-1),(-2,3),(-1,3),(2,-1),(2,3)\}$,
$V_{P\to Q} = \{(-1,-1),(0,-1),(0,3),(2,-1),(2,3)\}$,
$V_{P\leftrightarrow Q} = \{(2,-1),(-1,-1),(0,-1),(0,3)\}, V_{\sim P\to Q} = V_{P\vee Q}$,
$V_{P\wedge\sim Q} = \{(-2,-1),(-2,3),(-1,3)\}, V_{\sim P\leftrightarrow\sim Q} = V_{P\leftrightarrow Q}$

d) $V_P = \{(0,-1),(2,-1),(2,4),(2,5)\}$,
$V_{\sim P} = \{(-3,-1),(-3,4),(-3,5),(0,4),(0,5)\}$,
$V_Q = \{(-3,-1),(-3,4),(-3,5),(0,4),(0,5),(2,4),(2,5)\}$,
$V_{\sim Q} = \{(0,-1),(2,-1)\}, V_{P\wedge Q} = \{(2,4),(2,5)\}, V_{P\vee Q} = A \times B$,
$V_{P\to Q} = \{(-3,-1),(-3,4),(-3,5),(0,4),(0,5),(2,4),(2,5)\}$,
$V_{P\leftrightarrow Q} = \{(2,4),(2,5)\}, V_{\sim P\to Q} = A \times B, V_{P\wedge\sim Q} = \{(0,-1),(2,-1)\}$,
$V_{\sim P\leftrightarrow\sim Q} = V_{P\leftrightarrow Q}$

e) $V_P = D_P, V_{\sim P} = \emptyset, V_Q = D_Q, V_{\sim Q} = \emptyset, V_{P\wedge Q} = \{1,2,3\}$,
$V_{P\vee Q} = \{-1,1,2,3,4,5,6\}, V_{P\to Q} = D_Q, V_{P\leftrightarrow Q} = \{1,2,3\}, V_{\sim P\to Q} = V_{P\vee Q}$,
$V_{P\wedge\sim Q} = \emptyset, V_{\sim P\leftrightarrow\sim Q} = \{1,2,3\}$