

$$P(x) = x \geq 0 \quad R(x) : (x-2)^2 = 0$$

$$Q(x) : x^3 \geq 9 \\ x \geq \sqrt[3]{9}$$

$$a) \exists x (P(x) \wedge R(x))$$

$$(x-2)^2 = 0$$

$$x-2 = 0$$

$$x = 2$$

✓

$$\forall x (P(x) \rightarrow Q(x))$$



$$x = 1 \quad P(x) \text{ ✓}$$

$$x = 2 \quad Q(x) \text{ F}$$

$$\exists n (A_n = 0)$$

$$A_n = 2n - 1 \quad \boxed{U = \mathbb{N}_0}$$

$$\exists n. \quad 2n - 1 = 0$$

$$2n = 1$$

$$n = \frac{1}{2}$$

$\neq$

$n \notin \mathbb{N}$

$$a) \forall x [P(x) \rightarrow Q(x)]$$

$$\neg (p \vee q)$$

$$\neg p \wedge \neg q$$

$$\neg \left( \forall x [P(x) \rightarrow Q(x)] \right)$$

$$\exists x \neg [P(x) \rightarrow Q(x)]$$

$$\exists x \neg [\neg P(x) \vee Q(x)]$$

$$EL$$

$$\exists x (P(x) \wedge \neg Q(x)) \quad \text{DN e } I_n$$

$$\exists x [P(x) \rightarrow (Q(x) \vee R(x))] \quad \neg \forall \rightarrow \exists \neg$$

$$\neg (\exists x [P(x) \rightarrow (Q(x) \vee R(x))]) \quad \neg \exists \rightarrow \forall \neg$$

$$\forall x \neg [P(x) \rightarrow (Q(x) \vee R(x))]$$

$$\forall x \neg (\neg P(x) \vee Q(x) \vee R(x))$$

$$\forall x (P(x) \wedge \neg Q(x) \wedge \neg R(x))$$

$$\forall m \exists n : 2m = n$$

$$m, n \in \mathbb{N}$$

$$1, \quad 2 \cdot 1 = 2 \quad \checkmark$$

$$2, \quad 2 \cdot 2 = 4 \quad \checkmark$$

$$3, \quad 2 \cdot 3 = 6 \quad \checkmark$$

$$m = k, \quad 2 \cdot k = n \in \mathbb{N}$$



$$\exists m \forall n (2nm = m)$$

$$m, n \in \mathbb{N}$$

$$2nm = m$$

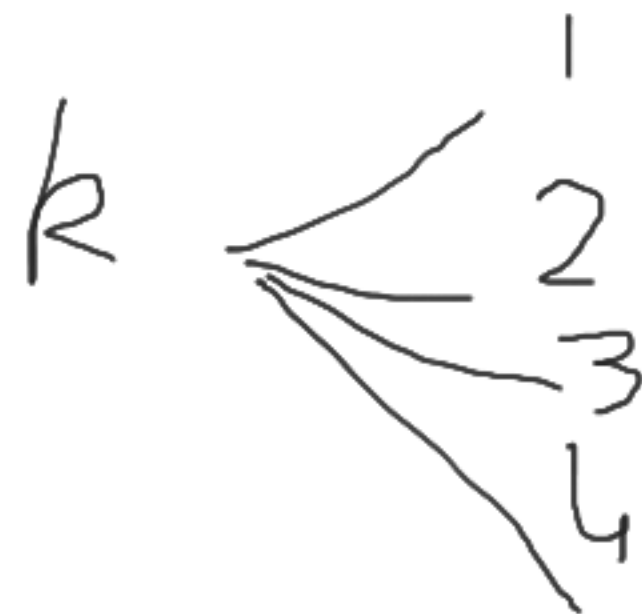
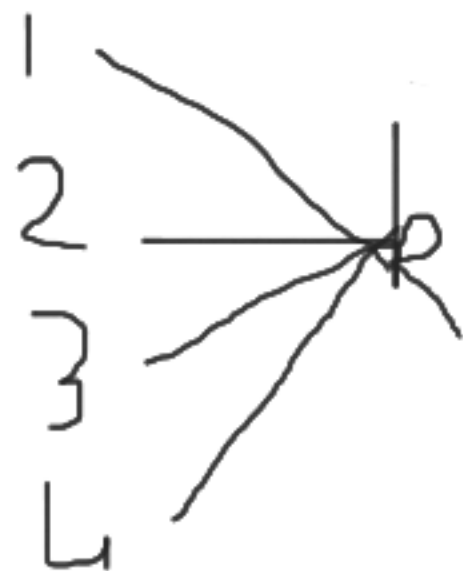
$$2n = 1$$

$$n = \frac{1}{2}$$

F

$\forall \exists$

$\exists \forall$



$P(x) = x$  es perfecto

$C(x) =$  es Confuso

$\exists$  perfecto que no confuso

$$\neg \left( \exists x \left( P(x) \wedge \neg C(x) \right) \right)$$

$$\forall x \neg \left( P(x) \wedge \neg C(x) \right)$$

$$\forall x \neg P(x) \vee C(x) \quad \exists M \neq I \text{ nu}$$

todos los libros son confusos o limpios

$U$  - Alumnos del mundo

$R(x)$   $x$  es de la carrera

$C(x) \rightarrow$

$U$  - Alumnos de la carrera

$M(x, y)$   $x$  se matricula en  $y$

$\forall x \exists y : M(x, y)$