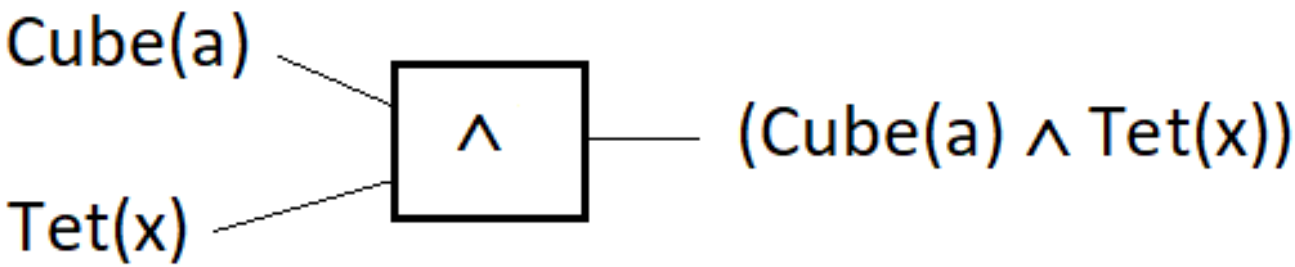
Wff or not wff?

Get ready to play!!!

1. $(\text{Cube}(a) \wedge \text{Tet}(x))$

(Cube(a) ∧ Tet(x))

Circuit diagram:



2. $\exists$Cube(x)

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- A quantifier must always be followed by a variable, e.g.

$\exists x$ Cube(x)

3. $\exists y\ Tet(a)$

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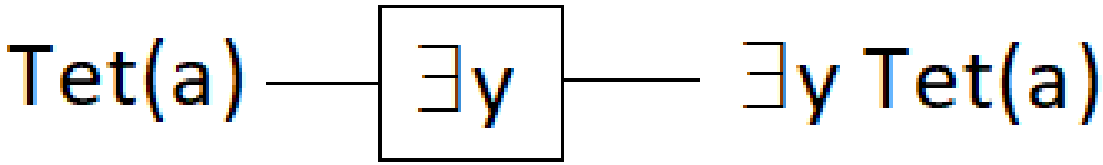
Circuit diagram:



- You can put a quantifier (with attached variable) on the front of any wff, and the result is another wff.

4. Smaller(Cube(a), Tet(b))

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- The only things you can put into a predicate hole are a *name*, a *variable*, or a *function*.
- You can't put a predicate into another predicate. In this case you need to write:

$$(\text{Cube}(a) \wedge \text{Tet}(b)) \wedge \text{Smaller}(a, b)$$

5. $\exists z(\mathrm{Tet}(x) \rightarrow \mathrm{Cube}(a))$

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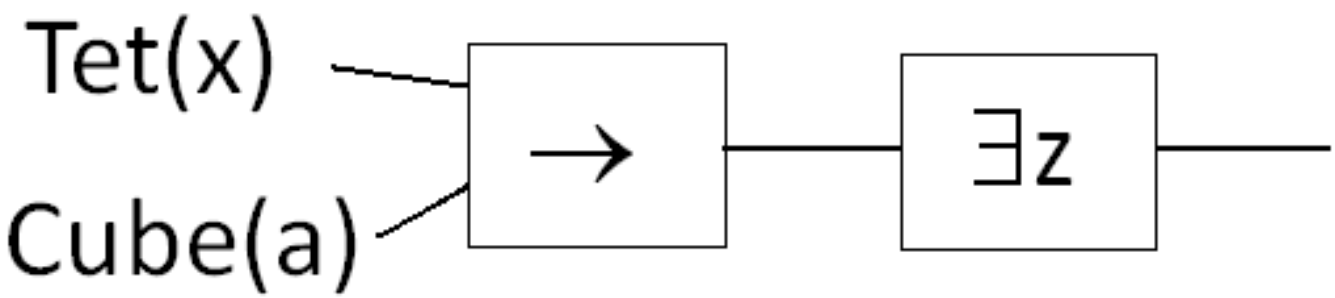
$\exists z(Tet(x) \rightarrow Cube(a))$

- Circuit diagram:



6. $\exists c\ \mathrm{Large}(c)$

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A quantifier must be followed by a *variable*, i.e. one of the letters: t, u, v, w, x, y, z.

So you need (e.g.):

$\exists v\ \mathrm{Large}(c)$

7. $(\text{Smaller}(\forall, a) \rightarrow \text{Large}(a))$

$$(\text{Smaller}(\forall, a) \rightarrow \text{Large}(a))$$

$(\text{Smaller}(\forall, a) \rightarrow \text{Large}(a))$

- The only things you can put into a predicate hole are a **name**, a **variable**, or a **function**.
- You can't put a quantifier *directly* into the hole of a predicate. In this case you need:

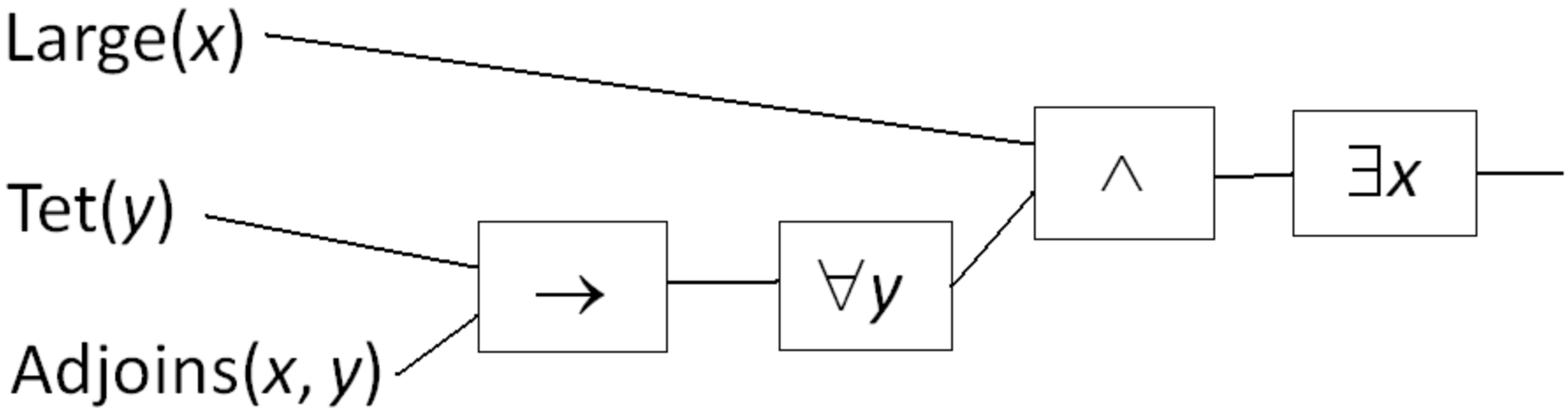
$$(\forall x\ \text{Smaller}(x, a) \rightarrow \text{Large}(a))$$

8. $\exists x(\text{Large}(x) \wedge \forall y(\text{Tet}(y) \rightarrow \text{Adjoins}(x, y)))$

$$\exists x(\text{Large}(x) \land \forall y(\text{Tet}(y) \rightarrow \text{Adjoins}(x, y)))$$

$\exists x(\text{Large}(x) \wedge \forall y(\text{Tet}(y) \rightarrow \text{Adjoins}(x, y)))$

- Circuit diagram:



9. $(\text{Cube}(a) \rightarrow \text{Large}(a) \vee \text{Small}(y))$

$$(\text{Cube}(a) \rightarrow \text{Large}(a) \vee \text{Small}(y))$$

$(\text{Cube}(a) \rightarrow \text{Large}(a) \vee \text{Small}(y))$

- You need to *add brackets* when using $\rightarrow$ and $\vee$. Then, depending on the order of construction, you'll get either:

$(\text{Cube}(a) \rightarrow \text{Large}(a)) \vee \text{Small}(y)$ or

$\text{Cube}(a) \rightarrow (\text{Large}(a) \vee \text{Small}(y))$

- (I left off the outer pair of brackets here.)

10. $\forall y(Dentist(father(y)) \rightarrow Rich(y))$

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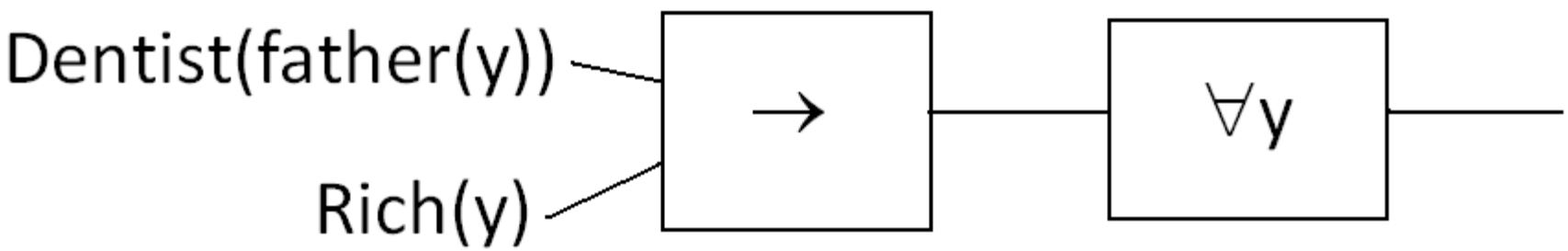
$\forall y(\text{Dentist}(\text{father}(y)) \rightarrow \text{Rich}(y))$

- Circuit diagram:



Count up your own score!

10	--	Top dog
9	--	Rescue dog
8	--	Guard dog
7	--	Good family pet
6	--	Lounging dog -- sleeps all day
5	--	Couch chewer
4	--	Barks all the time
3	--	Wet and stinky
2	--	Flea-bitten mutt
1	--	Toilet bowl drinker
0	--	Leg humper