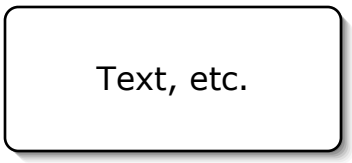
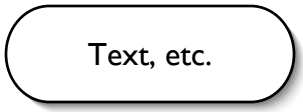
Legend:

State markers:

Main user visible content and interface:



Control:



Navigational move:

Correct move:

Incorrect move:

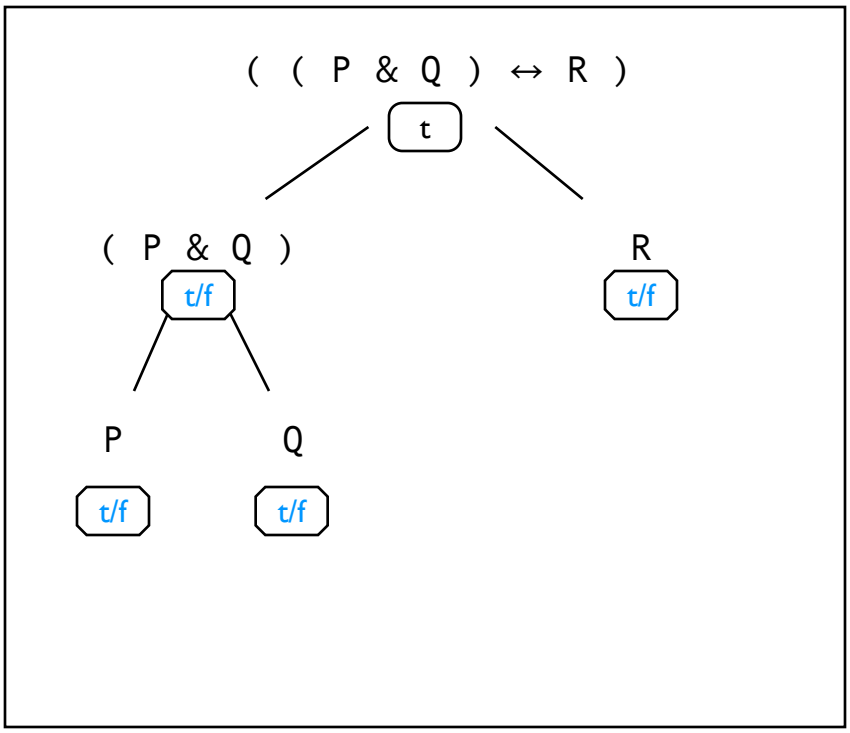
Branching/multiple acceptable solutions move:

Feedback content:

Start

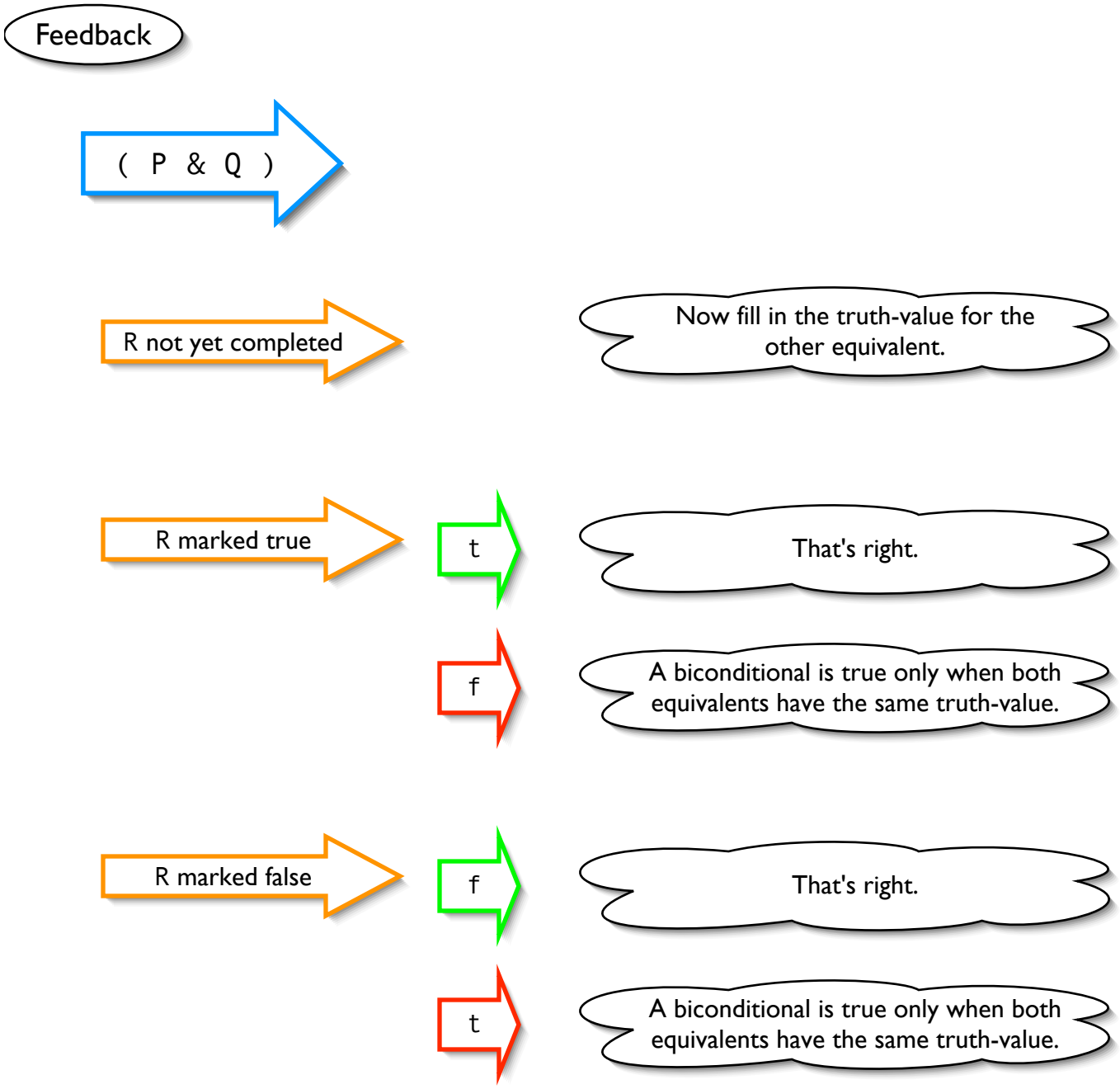
Find a truth-value assignment that makes the formula below true.

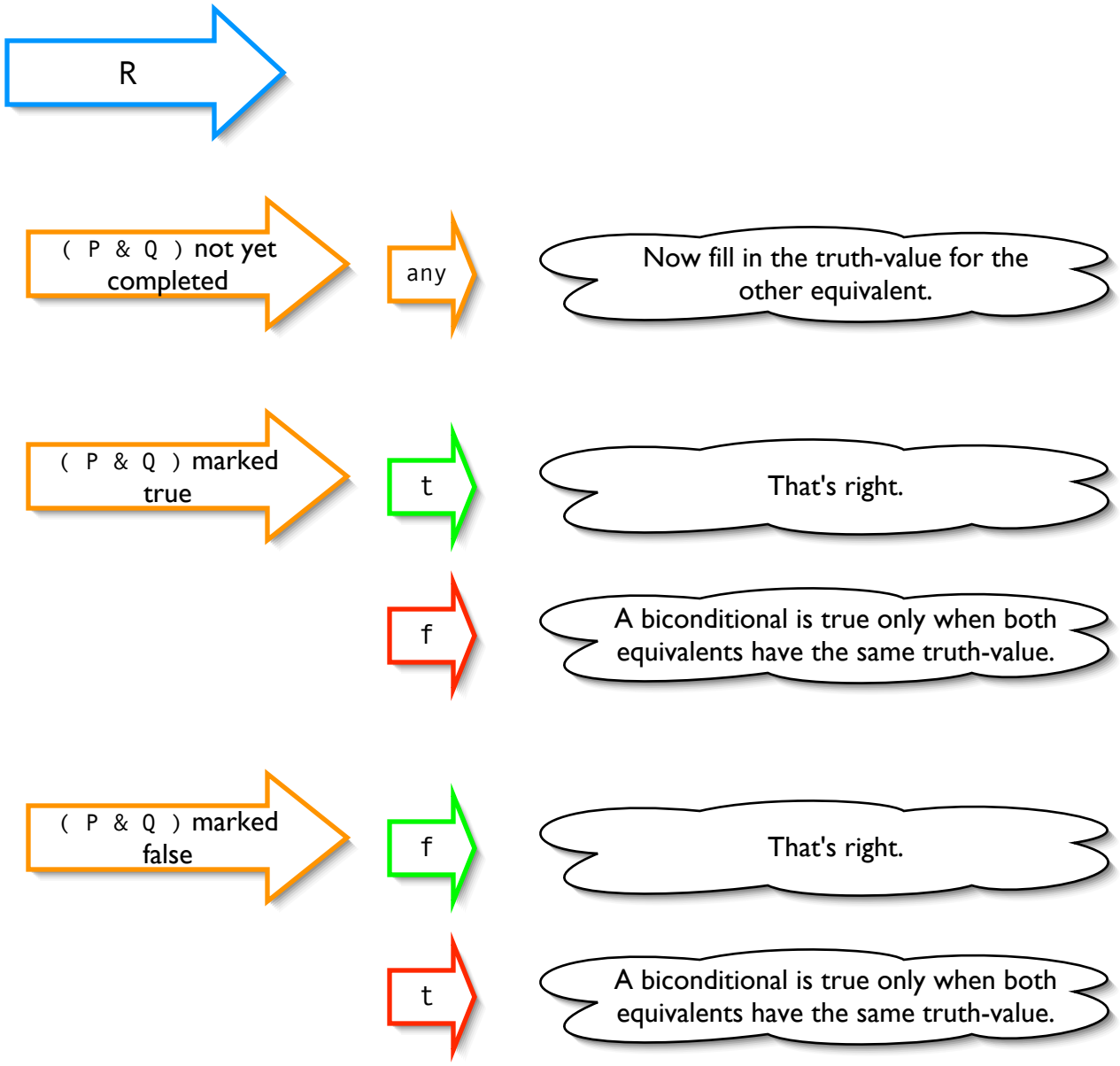
We've provided you with the completed parse tree for the formula. All you need to do is "chase truth down the tree", marking each node as either true or false. Once you've correctly marked each node, you're done.

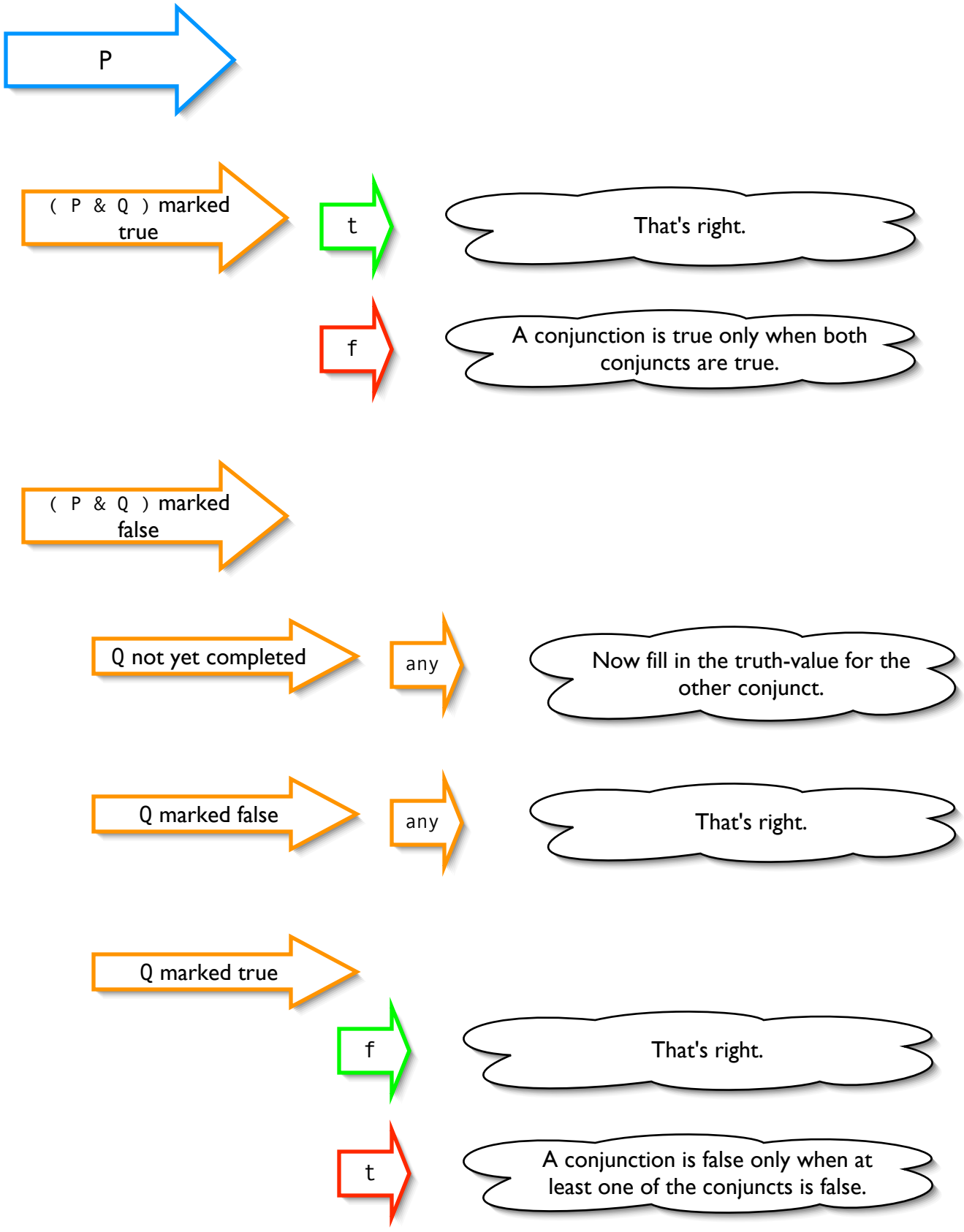


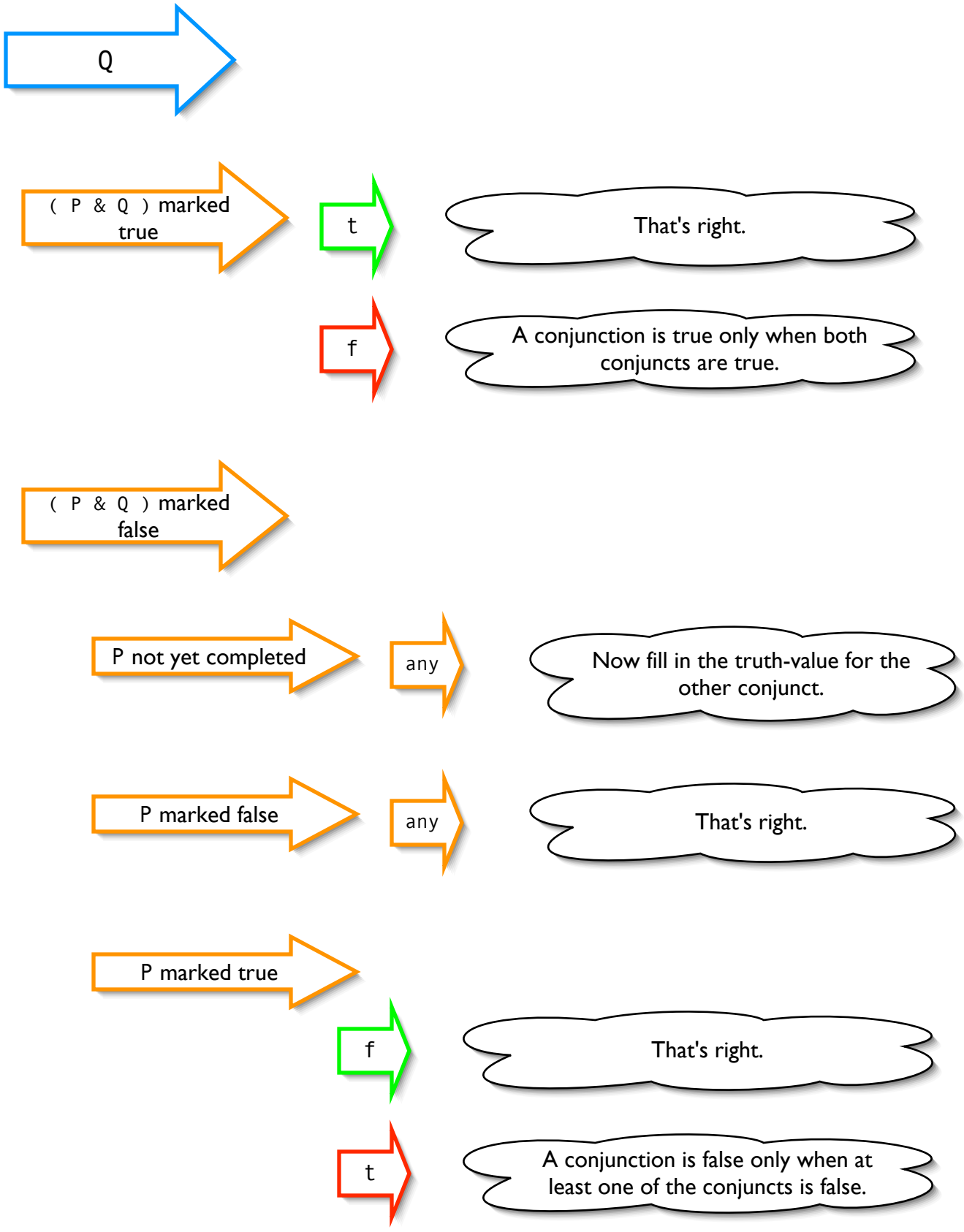
Hint

Items marked as t/f are the comboboxes. The formulae should be visible even after the node has been classified a either true or false, so the formula at the node should not be included in the combobox itself.


Feedback
(P & Q)
R not yet completed
Now fill in the truth-value for the other equivalent.
R marked true
t
That's right.
f
A biconditional is true only when both equivalents have the same truth-value.
R marked false
f
That's right.
t
A biconditional is true only when both equivalents have the same truth-value.


R
(P & Q) not yet completed
any
Now fill in the truth-value for the other equivalent.
(P & Q) marked true
t
That's right.
f
A biconditional is true only when both equivalents have the same truth-value.
(P & Q) marked false
f
That's right.
t
A biconditional is true only when both equivalents have the same truth-value.


P
(P & Q) marked true
t
That's right.
f
A conjunction is true only when both conjuncts are true.
(P & Q) marked false
Q not yet completed
any
Now fill in the truth-value for the other conjunct.
Q marked false
any
That's right.
Q marked true
f
That's right.
t
A conjunction is false only when at least one of the conjuncts is false.


Q
(P & Q) marked true
t
That's right.
f
A conjunction is true only when both conjuncts are true.
(P & Q) marked false
P not yet completed
any
Now fill in the truth-value for the other conjunct.
P marked false
any
That's right.
P marked true
f
That's right.
t
A conjunction is false only when at least one of the conjuncts is false.

Hint

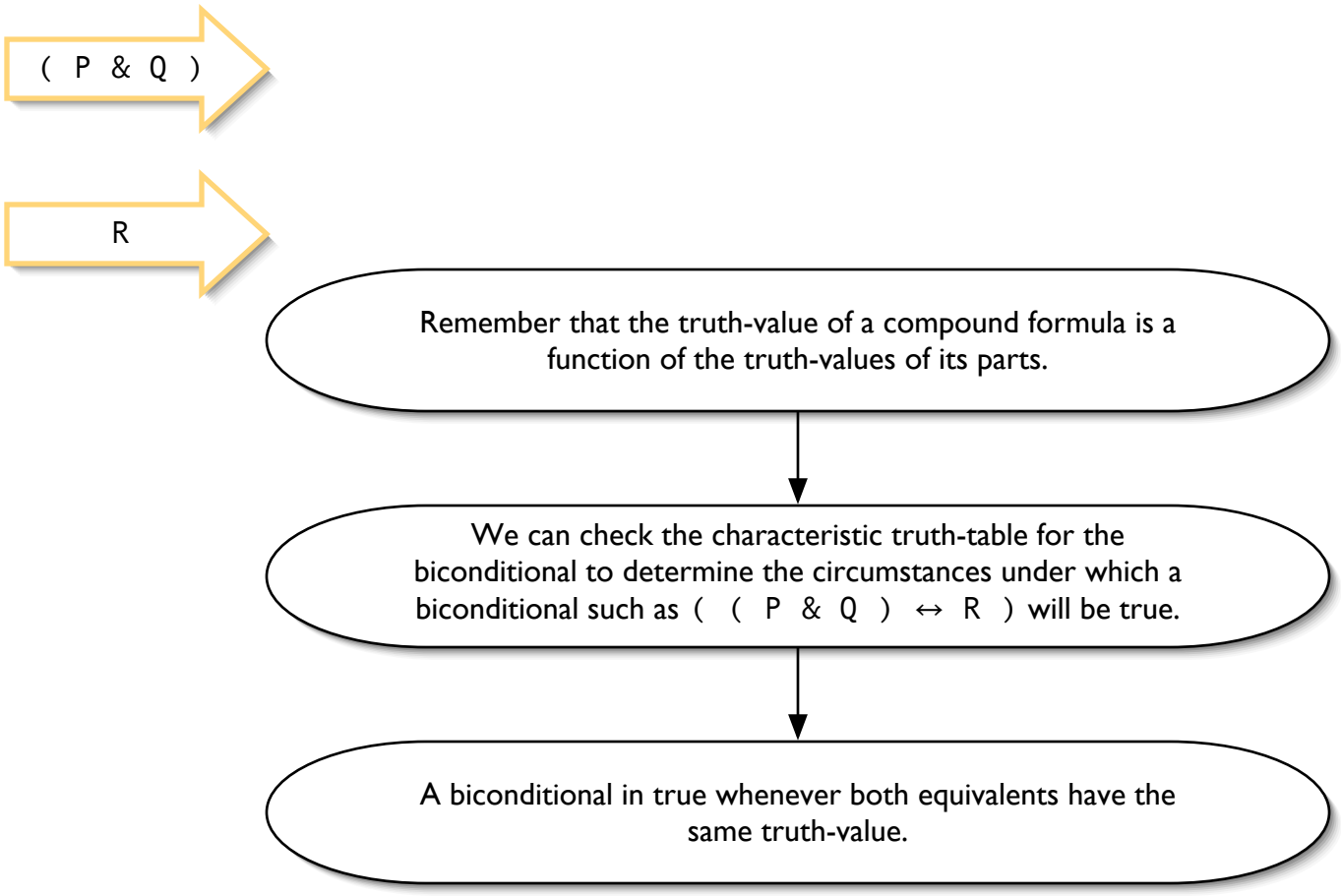
Each hint should contain the following at the bottom, after specific hint content:

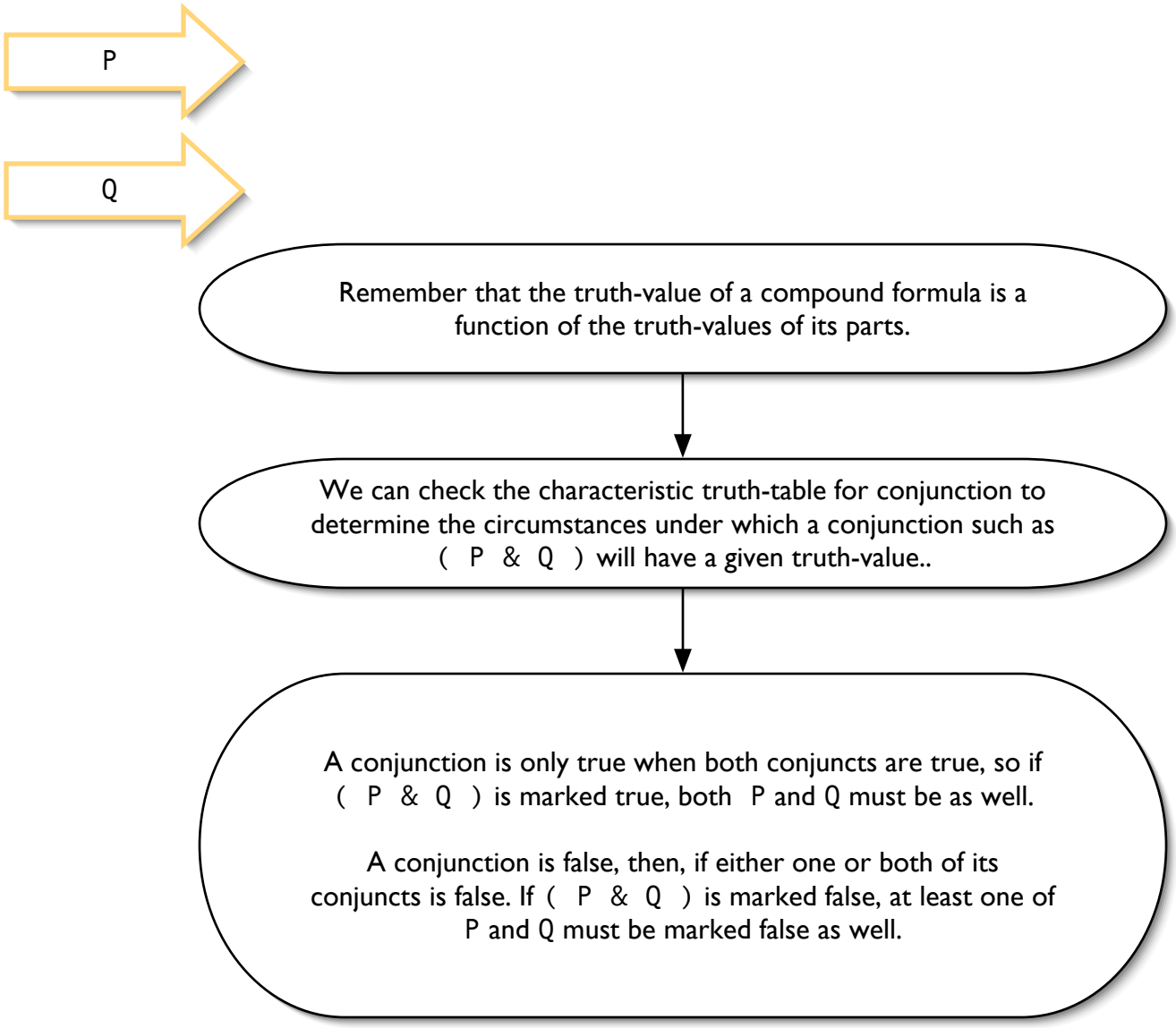
Click here to view the characteristic truth-tables for the connectives.

The link should be to the following file:

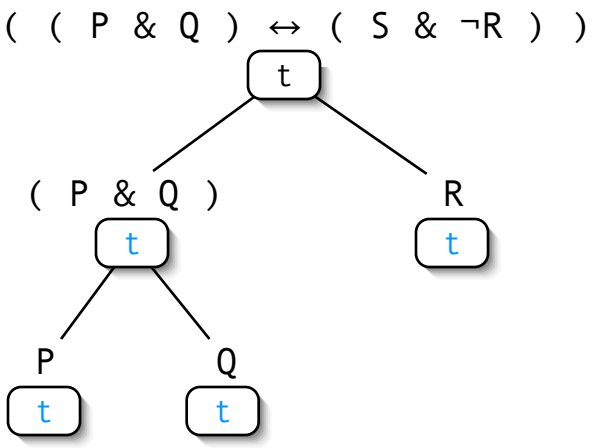
temptruthvalueassignment2hint.gif

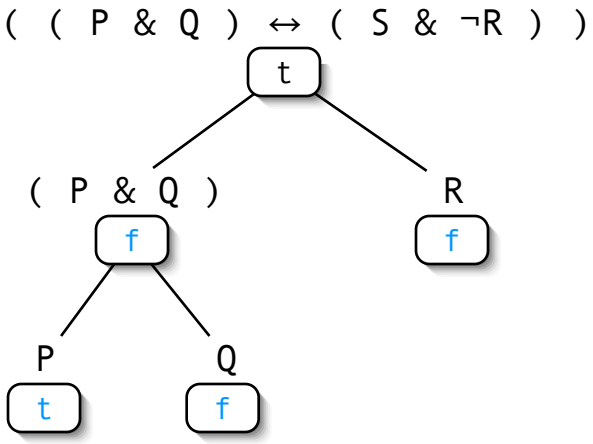
The hint to be displayed at a given stage is that for the first incomplete node, from top to bottom and left to right, i.e., the first in the following order not answered correctly when the hint is requested.

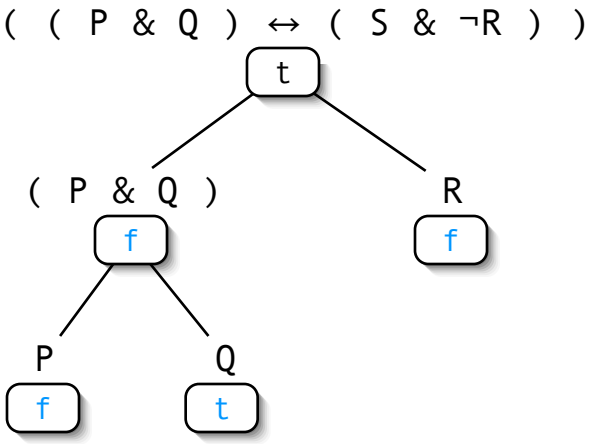


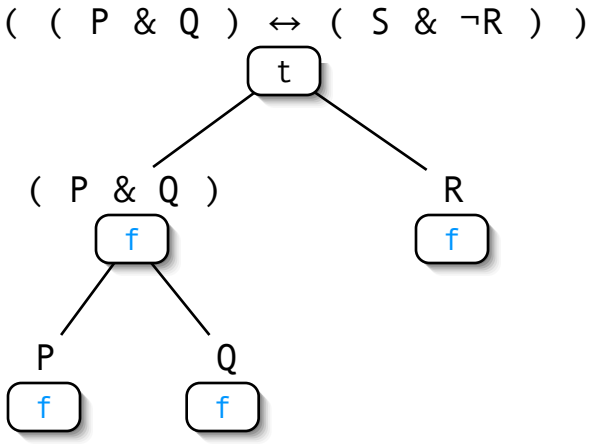

P
Q
Remember that the truth-value of a compound formula is a function of the truth-values of its parts.
We can check the characteristic truth-table for conjunction to determine the circumstances under which a conjunction such as (P & Q) will have a given truth-value..
A conjunction is only true when both conjuncts are true, so if (P & Q) is marked true, both P and Q must be as well.
A conjunction is false, then, if either one or both of its conjuncts is false. If (P & Q) is marked false, at least one of P and Q must be marked false as well.

Solutions:


((P & Q) ↔ (S & ¬R))
t
(P & Q)
R
t
t
P
Q
t
t


((P & Q) ↔ (S & ¬R))
t
(P & Q)
R
f
f
P
Q
t
f


((P & Q) ↔ (S & ¬R))
t
(P & Q)
R
f
f
P
Q
f
t


((P & Q) ↔ (S & ¬R))
t
(P & Q)
R
f
f
P
Q
f
f