4.3

(I'll use $\vdash$ to indicate reduction steps)

S1

$$\neg(p \vee q) \vdash \neg(\mathbf{T} \vee \mathbf{F}) \vdash \neg\mathbf{T} \vdash \mathbf{F}$$
$$\neg p \vee q \vdash \neg\mathbf{T} \vee \mathbf{F} \vdash \mathbf{F} \vee \mathbf{F} \vdash \mathbf{F}$$

S2

$$\neg(p \vee q) \vdash \neg(\mathbf{T} \vee \mathbf{T}) \vdash \neg\mathbf{T} \vdash \mathbf{F}$$
$$\neg p \vee q \vdash \neg\mathbf{T} \vee \mathbf{T} \vdash \mathbf{F} \vee \mathbf{T} \vdash \mathbf{T}$$

S3

$$\neg(p \vee q) \vdash \neg(\mathbf{F} \vee \mathbf{T}) \vdash \neg\mathbf{T} \vdash \mathbf{F}$$
$$\neg p \vee q \vdash \neg\mathbf{F} \vee \mathbf{T} \vdash \mathbf{T} \vee \mathbf{T} \vdash \mathbf{T}$$

4.5

a. "The train will either arrive or it won't arrive." This is not analytically true; it is a logical tautology (of the form $p \vee \neg p$).

b. "If it rains, we'll get wet." I think this has to be synthetic, because the speaker could be holding an umbrella, which would make the statement false.

c. "Every doctor is a doctor." Though Saeed's discussion classified "my father is my father" as analytic, I tend to disagree. I'd say this is a tautology. Denote "x is a doctor" by $p(x)$. Then this statement is of the form $\forall x.p(x) \Rightarrow p(x)$, which is a logical tautology; i.e. it holds no matter what p means. If I understood the discussion correctly, analytic truths are tautological only once you incorporate the meanings of the words.

d. "If albert killed a deer, then Albert killed an animal." Finally, this is analytic, because in our language, a deer is an animal, so this statement must be true (but only after knowing the relationship between deer and animal).

e. "Madrid is the captial of Spain." This is synthetic, as it is concievable that Madrid could, one day, not be the capital of Spain anymore.

f. "Every city has pollution problems." This is synthetic, as it may not even be true right now.

4.6

1. *a* entails *b*, because "passed" and "failed" are simple antonyms (i.e. "passed" is the same as "didn't fail").

2. *a* entails *b*, because, well, of the relationship between the words "inherit" and "own".

3. *a* does not entail *b*, since Cassidy could have sold the farm.

4. *a* entails *b* (under the assumption that the word "poison" implies "kill", rather than just "make sick" or something).

5. *a* entails *b*, since *b* is just the passive construction of *a* (thus *b* entails *a* also).

6. *a* does not entail *b*, because if nobody liked the show, then it is still true that "not everyone" liked the show.

Um, how were we supposed to use the composite truth table for those?

4.7

announce Factive: "he announced that #4 took the lead" and "he didn't announce that #4 took the lead" both presuppose that "#4 took the lead" (this is arguable, because just because something is announced does not make it true).

assume Not factive: "she assumed that armageddon was not coming" does not presuppose that "armageddon was not coming".

be Not factive.

aware Factive: "he was aware that she had been crying" and "he was not aware that she had been crying" both presuppose that "she had been crying".

believe Not factive. Neither "John believes that aliens exist" nor "John doesn't believe that aliens exist" presuppose that "aliens exist".

be fearful Hmmm, not factive, I think. "Sue was fearful of aliens coming" does not presuppose that aliens were coming.

be glad Factive. "Jamie was glad that it was christmas" and "Jamie was not glad that it was christmas" both presuppose that it was christmas.

be sorry Factive. Use the same sentence as above.[1]

be worried Not factive. "Paul was worried that the red coats were coming" does not presuppose that they were coming.

know Factive. "Daniel knew that there was a blue horse" and "Daniel didn't know that there was a blue horse" both presuppose that "there was a blue horse".

reason Factive. That is arguable, because "Willard Quine reasoned that 'this statement is false' must be false" doesn't presuppose that what he reasoned was true, only that he reasoned it.

reported Factive. "Jimmy reported that the ant colony had grown" and "Jimmy did not report that the ant colony had grown" both presuppose that "the ant colony had grown".

4.8

The following will be the reasoning, so I don't have to monotonously repeat it. If I say "presuppose", then I negated the sentence and b was still true. If I say "entail", then I negated the sentence and b did not necessarily follow anymore.

1. Presuppose.

[1] Yeah, I'm lazy, I know.

2. Entail.

3. Presuppose.

4. Entail.

5. Presuppose.