SECTION 1.1 Propositional Logic

4. a) Jennifer and Teja are not friends.

   b) There are not 13 items in a baker's dozen. (Alternatively: The number of items in a baker's dozen is not equal to 13.)

   c) Abby sent fewer than 101 text messages yesterday. Alternatively, Abby sent at most 100 text messages yesterday. Note: The first printing of this edition incorrectly rendered this exercise with "every day" in place of "yesterday." That makes it a much harder problem, because the days are quantified, and quantified propositions are not dealt with until a later section. It would be incorrect to say that the negation in that case is "Abby sent at most 100 text messages every day." Rather, a correct negation would be "There exists a day on which Abby sent at most 100 text messages." Saying "Abby did not send more than 100 text messages every day" is somewhat ambiguous—do we mean $\neg\forall$ or do we mean $\forall\neg$?

   d) 121 is not a perfect square.

18. a) This is $\mathbf{F} \to \mathbf{F}$, which is true.

    b) This is $\mathbf{F} \to \mathbf{F}$, which is true.

    c) This is $\mathbf{T} \to \mathbf{F}$, which is false.

    d) This is $\mathbf{T} \to \mathbf{T}$, which is true.

30. A truth table will need 2^n rows if there are n variables.

    a) $2^2 = 4$ b) $2^3 = 8$ c) $2^6 = 64$ d) $2^5 = 32$