1. All integers are not even.
   a. The “not” is this sentence is often intended to give the negation of “All integers are even.”
      Let \( Z \) denote the set of all integers. So the intended meaning might be
      \[ \neg (\forall x \in Z, \ x \ is \ even). \]
      I.e., “Not all integers are even.”
      Or, “\( \exists x \in Z \) such that \( x \) is not even” [Of course, this is a true statement.]
   b. This sentence could reasonably be interpreted to mean that all integers have the property of being not even (i.e., odd, since “not even” is the same as “odd” for integers). So an interpretation might be
      “\( \forall x \in Z, \ x \ is \ odd. \)”
      Or, to stick with the word “even”,
      “\( \forall x \in Z, \ x \ is \ not \ even. \)” [Of course, this is a false statement.]

2. Chris and Robin are not tall. (Read the instructions in the Lesson!)
   This is ambiguous for the same reason as Sentence 1 above. (NOT because of “tall” or, simply, “not tall”.)
   a. The “not” is this sentence is often intended to give the negation of “Chris and Robin are tall.”
      Let \( Z \) denote the set \{Chris, Robin\}. So the intended meaning might be
      \[ \neg (\forall x \in Z, \ x \ is \ tall). \]
      I.e., “Not both Chris and Robin are tall.”
      Or, “\( \exists x \in Z \) such that \( x \) is not tall”. I.e., “Chris is not tall or Robin is not tall.”
   b. This sentence could reasonably be interpreted to mean that both Chris and Robin have the property of being not tall. So an interpretation might be
      “\( \forall x \in Z, \ x \ is \ not \ tall. \)” I.e., “Chris is not tall and Robin is not tall.”

3. 77 is not even and prime.
   a. As in Problems 1 and 2, the “not” could be intended to negate the entire statement “77 is even and prime”, which is the same as “77 is even and 77 is prime”. So the intended meaning might be
      \[ \neg [(77 \ is \ even) \land (77 \ is \ prime)] \]
      I.e., “77 is not even or 77 is not prime.” [This is true.]
   b. The “not” before even in the sentence might be intended to apply, or interpreted to apply, only to “even”. This sentence could reasonably be interpreted to mean
      “77 is not even and 77 is prime.” [This is false.]
   c. The “not” in the sentence might be intended to apply, or interpreted to apply, to each of the properties “even” and “prime”. This sentence could possibly be interpreted to mean
      “77 is not even and 77 is not prime.” [This is true, but different from (a).]

4. 77 is not even and not prime. [Underlining added for clarity.]
   Take the solution given in Prob. 3 and everywhere replace the “prime” by “not prime”.

   Think about not (even and prime). What does this mean?