3. [12 pts - 4 each] Classify each statement below as a generalization or existential, then tell whether it is true or false and support your claim with the required type of argument:

(a) Nobody likes the Steelers.
   \[ \text{generalization - false} \]
   \[ \text{My friend Kathy does} \]

(b) Some of my students live off-campus.
   \[ \text{existential - true} \]
   \[ \text{See dots} \]

(c) If you're taking this course, you're not yet certified to teach in Pennsylvania.
   \[ \text{generalization - true} \]
   \[ \text{This course is part of what the State of PA requires for certification.} \]

4. [15 pts - 5 each] For each sequence below, find a formula for the \(n\)th term, showing clear work or else verbally explaining your thought process.

(a) 250, 243, 236, 229, ...
   \[ \Rightarrow \frac{-7}{-7} - \frac{7}{-7} \]
   \[ \text{It's arithmetic, so } -7n + \frac{257}{-7} \text{ is the formula.} \]

(b) 3, 12, 48, ...
   \[ \frac{192}{3} \]
   \[ \text{It's geometric, so } 4^n \text{ is the formula.} \]

(c) 4, 7, 12, 19, ...
   \[ \text{(no short-cuts possible)} \]
   \[ \frac{1}{4} \]
   \[ \frac{2}{7} \]
   \[ \frac{3}{12} \]
   \[ \frac{4}{19} \]
   \[ \text{The pattern is } n+3, n+5, n+9, n+15 \]
   \[ \text{So } n^2 + 3 \text{ is the formula.} \]