Problems from Assignment 5

1. Let $X \sim \mathscr{G}(p)$. (Note $\mathscr{G}$ is the geometric distribution). And $A = 3\mathbb{N} = \{3, 6, 9, 12, \ldots\}$.

   (a) Suppose $p = \frac{1}{3}$. Find $P(X \in A)$.

   (b) Find $P(X \in A)$ in general (i.e. as a function of p).

   (c) Find $P(X \in A)$ when $p = 1$ and explain why this is so.

   (d) Explain why p can't be 0.

   (e) Find $\lim_{p \to 0} P(X \in A)$ and explain why this makes sense.