

Problems from Assignment 9

1. Let  $X \sim \mathcal{G}(p)$ . (Note  $\mathcal{G}$  is the geometric distribution). And  $A = 3\mathbb{N} = \{3, 6, 9, 12, \dots\}$ .
  - (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  $\lim_{p \rightarrow 0} P(X \in A)$  and explain why this makes sense.