

## Bonus Problem: Convergence in Distribution

**Situation.** Let  $X_p \sim \text{NegBin}(n, p)$ . Show that  $pX_p$  converges in distribution as  $p \rightarrow 0$  and determine the limiting distribution.

*Hint.* Determine the mgf of  $pX_p$  and then use the MacLaurin Series representation of the exponential function. Also, the limiting distribution is continuous.