

HW8

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1. Let $p_r = Pr\{X = r\} = pq^{r-1}$, then

$$\begin{aligned} P(u) &= \sum_{r \geq 0} p_r u^r \\ &= \sum_{r \geq 0} pq^{r-1} u^r \\ &= \frac{p}{q} \sum_{r \geq 0} q^r u^r \\ &= \frac{p}{q} \frac{1}{1 - qu} \end{aligned}$$