MATH48181/68181: EXTREME VALUES AND FINANCIAL RISK
SEMESTER 1
SOLUTIONS TO QUIZ PROBLEM 2

Suppose X is a random variable with probability mass function

$$p(x) = \begin{cases} \frac{1}{K}, & \text{if } x = 1, \\ \frac{1}{x(x-1)}, & \text{if } x = 2, \ldots, K \end{cases}$$

for $K > 1$.

Clearly, $w(F) = K$. Note that

$$
\begin{aligned}
\lim_{k \to w(F)} \frac{p(k)}{1 - F(k-1)} &= \frac{p(K)}{1 - F(K-1)} \\
&= \frac{p(K)}{P(X \le K - 1)} \\
&= \frac{p(K)}{P(X > K - 1)} \\
&= \frac{p(K)}{P(X = K)} \\
&= 1.
\end{aligned}
$$

Hence, there can be no domain of attraction that F can belong to.