let $n=2$, $m=6$

$$p(\max=3) = p(\max\le 3) - p(\max\le 2)$$
$$= \left(\frac{3}{6}\right)^2 - \left(\frac{2}{6}\right)^2$$

$$ev = 1\cdot p(\max=1) + 2\cdot p(\max=2) + \cdots + 6\cdot p(\max=6)$$
$$= \sum_{i=1}^{6} i\left(\left(\frac{i}{6}\right)^n - \left(\frac{i-1}{6}\right)^n\right)$$

$$p(\max=k) = \left(\frac{k}{6}\right)^n - \left(\frac{k-1}{6}\right)^n$$
$$p(\max\le k) = \left(\frac{k}{6}\right)^n$$

$$= 1\cdot\left(p(\max\le 1) - \cancel{p(\max\le 0)}^{0}\right) + 2\left(p(\max\le 2) - p(\max\le 1)\right)$$
$$+ \cdots$$

$$= \cancel{p(\max\le 1)} - \cancel{p(\max\le 0)}^{=0} + \cancel{2p(\max\le 2)} - \cancel{2p(\max\le 1)}^{1}$$
$$+ \cancel{3p(\max\le 3)} - \cancel{3p(\max\le 2)}^{1} + \cancel{4p(\max\le 4)}$$
$$- \cancel{4p(\max\le 3)}^{1} + \cancel{5p(\max\le 5)} - \cancel{5p(\max\le 4)}^{1}$$
$$+ 6p(\max\le 6) - \cancel{6p(\max\le 5)}^{1}$$

$$= -p(\max\le 1) - p(\max\le 2) - p(\max\le 3) - p(\max\le 4)$$
$$- p(\max\le 5) + 6p(\max\le 6)$$

$$= \boxed{6p(\max\le 6) - \sum_{k=1}^{5} p(\max\le k)} = 6\cdot\left(\frac{6}{6}\right)^n - \sum_{k=1}^{5}\left(\frac{k}{6}\right)^n$$