

$$1 - \frac{x}{1!} + \frac{x(x-1)}{2!} - \frac{x(x-1)(x-2)}{3!} = \frac{(x-1)(x-2)}{2} - \frac{x(x-2)(x-3)}{3!}$$

$$\begin{aligned} 1 - \frac{x}{1!} + \frac{x(x-1)}{2!} - \frac{x(x-1)(x-2)}{3!} &= \\ &= \frac{(x-1)(x-2)}{2} - \frac{x(x-1)(x-2)}{6} = \\ &= -\frac{(x-1)(x-2)(x-3)}{3!} \end{aligned}$$