



$$1 \begin{pmatrix} 1 & 2 & \cdots & n \\ |+n & & & | \\ \vdots & & & \vdots \\ 1+n(n-1) & \cdots & & n^2 \end{pmatrix}$$

$$\begin{aligned} S &= \frac{(1+n)n}{2} + 0 + n + 2n + \cdots + (n-1) \cdot n \\ &= \frac{(1+n)n}{2} + \frac{(n-1) \cdot n \cdot n}{2} \\ &= \frac{n(n^2+1)}{2} \end{aligned}$$

$$2. \quad a^t b^t = b^s = e$$

$$a^t \cdot b^{t-s} = e$$

$$3 \quad \lim_{t \rightarrow 1^-} (1-t) \sum_{n=1}^{\infty} \left( 1 - \frac{1}{1+t^n} \right)$$

$$= \lim_{t \rightarrow 1^-} (1-t) \sum_{n=1}^{\infty} \sum_{m=1}^n t^{nm} \cdot (-1)^{m-1}$$

$$= \lim_{t \rightarrow 1^-} (1-t) \sum_{m=1}^{\infty} (-1)^{m-1} \sum_{n=1}^{\infty} t^{nm}$$

$$= \lim_{t \rightarrow 1^-} (1-t) \sum_{m=1}^{\infty} (-1)^{m-1} t^m \cdot \frac{1}{1-t^m}$$

$$= \sum_{m=1}^{\infty} (-1)^{m-1} \frac{1}{m}$$

$$= \ln 2$$

$$4. \quad x^q = 1$$

$$p(x) = C_n x^n + C_{n-1} x^{n-1} + \dots + C_0 = u(x) \cdot (x-1)^k$$

