

$$\begin{aligned}
 A &= \lim_{n \rightarrow \infty} \Delta x \left(a^2 + \left(a^2 + 2a\Delta x + (\Delta x)^2 \right) \right. \\
 &\quad \left. + \left(a^2 + 2 \cdot 2a\Delta x + 2^2 (\Delta x)^2 \right) \right. \\
 &\quad \left. + \dots \right. \\
 &\quad \left. + \left(a^2 + 2 \cdot (n-1)a\Delta x + (n-1)^2 (\Delta x)^2 \right) \right) \\
 &= \frac{1}{3} (b^3 - a^3) \quad (1)
 \end{aligned}$$