

$$1. 1) T_{\text{pipe}} = 2.1 \text{ ns}$$

$$2) \frac{T_{\text{pipe}} \cdot C_{\text{pi pipe}}}{T \cdot \text{CPI}} \quad \text{设有 } n \text{ 条指令}$$

$$= \frac{2.1(n+4)}{7n} = 0.3 \left(1 + \frac{4}{n} \right) \quad \lim_{n \rightarrow \infty} \text{时 故加速 } \frac{10}{3}$$

$$3) T_{\text{pipe}} \rightarrow 0.1 \text{ ns}$$

$$\frac{0.1}{7} \left(\frac{n+k-1}{n} \right) \quad \lim_{n \rightarrow \infty} \quad k \rightarrow \infty$$

$$\text{故 极限为 } \frac{1}{35} \quad \text{故加速 } 35 \text{ 倍}$$