Q 3.3

With pipelining

$T_p = len * t + (4 - 1) * t$ where $len = 24$ bits

Pipelined execution time

$$I = \frac{len * 4 * t}{len * t + (4-1) * t} = \frac{4 * len * t}{len * t + 3t}$$

$$= \frac{4 * len}{len + 3}$$

with pipelining

add operation is $\frac{4 * len}{len + 3}$ times faster.

mathematically

$$\lim_{len \to \infty} \frac{4 * len}{len + 3} = 4$$

so with pipelining when len goes to infinity it will be 4 times faster then sequential execution.